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THE PRESS AND THE PLUMBER.

Last week we stated that the importance of the national convention directed public attention to the plumber and his sanitary work. In this week's press clippings, the truth of our statement is found in the first-fruit of such publicity. In the "Springfield Union," Springfield, Mass., appears a special article commencing with the following paragraph:

"The National Association of Master Plumbers of the United States began a three days' session in Chicago yesterday. This association has a membership of about 10,000, representing all of the leading plumbers of the country. It was organized 28 years ago, and nearly all of the progress in plumbing and sanitation has taken place since the organization of this association, and in part, at least, is the result of the efforts of the men who constitute its membership to improve the standing of their trade. American plumbing now leads the world, and even England today is not much further advanced than the United States was 20 years ago. The plumbers claim that they are practically responsible for the health of the American people. They assert that scientific plumbing has done more than anything else toward the promotion of the public health of urban communities. Some of them take the ground that there ought to be a compulsory inspection of plumbing every year in all buildings, such as office buildings, factories, hotels, stores and apartment-houses."

The writer then gives a history of bathing from the time that Adam fell into the Euphrates coming home late at night and found it was a good thing to sober up on, through the magnificent bath-houses of Babylon, Rome, Athens and Carthage, and down to the immunity bath-houses at Springfield, Ill. The concluding paragraph of the article should be encouraging to the readers of "Domestic Engineering," showing as it does, the steady change of the public press in its consideration of the plumbing profession.

"The American plumber has been much berated because of his high charges, and now the recently organized plumbing trust probably will call forth new and more bitter objurgations. But after all, The American plumber is a person for all Americans to be proud of—for there is none other like unto him in all the world. Anyone who has undergone the shame and humiliation of witnessing his bathtub and bath water brought into his bedroom by an English serving maid; anyone who has tried to solve the mystery of the intricate combination

controlling the water-supply of that domestic aquarium which the Germans think is a bath-tub; anyone who has been parboiled in Japan, where bathtubs probably originated; anyone who has permitted a miserable drip-drop to trickle down his back in hottest India;—in short, anyone who has tried any other variety of plumber on the top side of earth must be, and is, **forever after the sworn supporter of the American plumber—let him charge what he will."**

So much from the East. In the "Ledger," Tacoma, Wash., several thousand miles west, appears the following paragraphs, which show conclusively the steady gains that the master plumbers of the country through their different organizations are making in the esteem of the press and therefore of the public.

Big Advance in Plumbing Science.

"Without heaping further abuse upon the plumber who is actuated by the same human nature as the rest of us, it may be said that too close attention cannot be given to the plumbing work of a new home. In this matter decided advances have been made during recent years and it is now possible to so arrange and construct house-plumbing as to insure great convenience and absolutely sanitary conditions.

"As a rule, one who constructs his first home knows more about plumbing after he has lived in it a year or two than he did when it was in the process of erection. There is, however, such a thing as profiting by the experience of others, though few are sufficiently lacking in self-conceit to avail themselves of the opportunity. The wise builder of a home will see to it that a competent plumber is employed to equip the house. He will likewise see to it that the specifications call for a high-grade of material, and that to the smallest detail. By insisting on these points and seeing that they are carried into effect, he will save himself a large measure of future annoyance and a large and unending payment for repairs.

"Leave It to Plumber."

"A long list of warnings and suggestions might be presented, but they would prove of small practical value—a real plumber is thoroughly well informed in the premises and one who is not can not acquire a comprehensive view of the subject off-hand. The proper advice to one about to build a home is, insist that the work be given to a thoroughly reliable and competent plumber—of which, notwithstanding our pleasantry and the standard newspaper jokes of the past fifty years, there is a liberal supply. This attended to, high-grade material and fixtures specified and the work properly inspected at every stage, satisfactory and enduring plumbing can be secured. As to the location of bath-tubs, lavatories, sinks and other prominent features, they should be figured out by the architect drawing the plans, who knows, or ought to know, all about the matter. **If you feel called to skimp anything connected with the house, don't let it be the plumbing."**

BUSINESS MANAGEMENT.

Many of our readers are signifying by personal letters their appreciation of our special departments in "Domestic Engineering". Referring to "Business Management", from Massillon, O., came the encouraging sentence "It is good; keep it up". Vincennes, Ind., says, "It is good and we think it is appreciated". Tonawanda, N. Y., sends the message, "A splendid opportunity for thought-exchange and should prove of great benefit to the readers".

From the far West, Portland, Ore., a reader states "It certainly is a fine thing; one can get as much information through your columns as from special trade schools". A subscriber in California says, "The department is very useful, and is one whose need has long been felt, especially by men who have not been in business long".

"Business Management" is our newer department, and its success has been most encouraging since its inauguration. Are you reading it week by week? We would be very glad to have your comments and assistance in making this one of the most valuable departments published in plumbing-trade journalism. It should prove all the more valuable since this is pointed out by leading plumbers in different states as being the chief source of weakness in the trade today. There are many good plumbers throughout the land, whose practical knowledge gained by hard experience and conscientious effort, enables them to do the finest work, but whose ignorance of the essentials of business management places them in the unenviable position of doing first-class work at third-class prices. Many also have fallen by the wayside and, in the endeavor to make prices yield profits, have succumbed to the temptation of doing low-grade work, and such work is having an evil influence on the trade in general in their locality. Only best work should be considered, and if it cannot be done at a profit, leave the job alone. Always remember that no job is the last job that you will get, but every job satisfactorily completed is a possible open door to similar profitable contracts in the near future.

NEW JERSEY JOTTINGS.

At an operation in Camden, where Frank E. Zimmerman is doing the plumbing work, thieves stole plumbers' brass goods valued at $35.

Merchantville is using two water-meters made by the Union Meter Co. and the Pittsburg Meter Co., in experimental tests. The borough will probably make the use of water-meters compulsory.

Riverton residents are planning to build a sewer system.

George Leathwhite, plumber, is president of the Southward Building and Loan Association, of Camden, which will soon hold its fiftieth annual meeting. Recently Mr. Leathwhite did praiseworthy work in helping to raise a fund of $200,000 to erect a new Camden homeopathic hospital. Among contributors to the fund were the Camden Heating Co., $100, and the Warren Webster & Co., $500.

Pank R. Jobes, heaters, ranges, etc., Camden, has joined the Board of Trade of that city.

Plumber Harry J. Farrel, of Camden, who attended the convention of the National Association of Master Plumbers at Chicago, is said to be the youngest state vice-president ever sent to any of the conventions. Mr. Farrel has had his motor-boat, the Catherine, placed in first-class condition for use on the Delaware river.

A COMPOUND VACUUM STEAM-HEATING SYSTEM.

By Chas. B. Arnold.

In general, a vacuum steam-heating system differs from the ordinary-return system in the maintaining of a partial vacuum in the main and in the independent return pipes from each radiator or coil in the system. The partial vacuum is created and maintained by means of a vacuum pump, either steam or belt-driven, and suitable vacuum devices are used in the return pipes, close to each radiator or coil, to permit the escape, from such radiator or coil, of the water of condensation and the air, at the same time holding back the steam. Steam and air will rush into the vacuum at many times the velocity of water. Owing to its friction the water of condensation is the most difficult element in the system to move or expel, and if a partial vacuum is maintained in the return pipes close to the radiator or coil, it acts continually as a suction and draws all the air and water away, allowing the steam to flow into all parts, even though no perceptible pressure is maintained at the inlet end of the system.

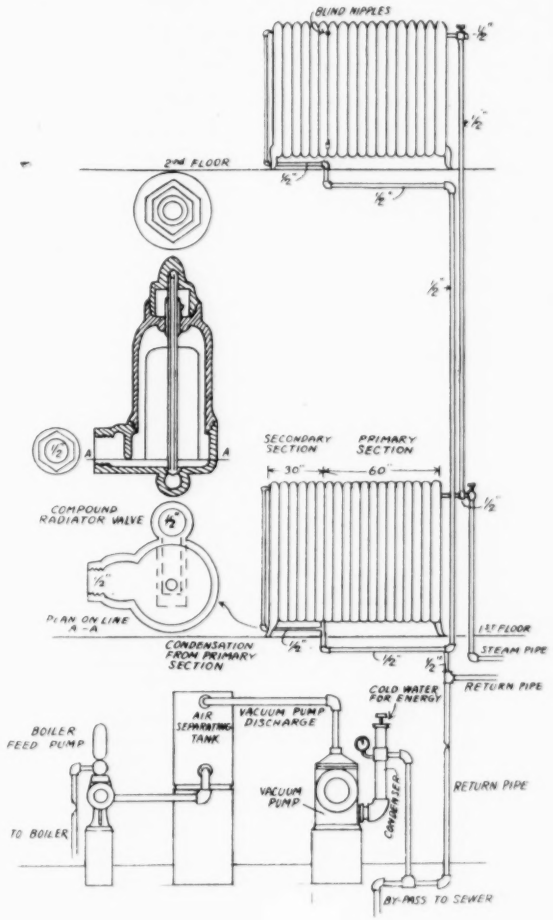
In the compound system under consideration two sections of radiators or coils are used, one being termed the "primary" or "pressure" section, and the other the "secondary" or "vacuum" section. The primary section is supplied with steam and its return connected to the automatic vacuum valve. This valve is balanced by a balanced float, under any reasonable steam pressure or any degree of vacuum. The vacuum of the secondary section extends through the hollow stem to the upper float-chamber and valve. The air that is carried along with the water of condensation naturally collects above the water in the dome-case, and until sufficient water accumulates in the case to float the valves off their seats they are both tight. When the float rises the lower valve discharges the water, and the air passes through the upper valve and is drawn down through the tube that forms the stem to which both valves and the float are fastened. The amount of air discharged, however, is regulated by an adjustable vent in this tube, the vent being usually about one-half of a 1-16-in. hole. By means of the clamped upper valve both valves can be adjusted tightly to their seats.

The lower guide-valve has no guide-wings or pins to catch sediment, but the discharge is free, and as the bottom opening is ½-in. in diameter in the small size and ⅝-in. in the large, danger of clogging is reduced to minimum. Of course, no dirt nor foreign matter can get above the water-line, so there is no danger of fouling even the small vent of the upper valve.

The water discharges from the vacuum valve into the secondary section, where a portion of it is re-evaporated, owing to the low pressure maintained in this section. After condensing again it passes to the vacuum pump through the return line. No valves are used on the inlet or outlet of the secondary section, which acts as a surface condenser.

It has been found that when operating under the atmospheric pressure in the steam main, or ¼-lb. above, and with 8 to 10-in. vacuum in the returns, the secondary radiator can be half as large as the primary, and this proportion is used in such practice.

As to heat regulation, it is pointed out that all the air and water are constantly removed by the vacuum pump, without dependence upon the steam pressure, the steam inlet-valve to the coil or radiator may be opened sufficiently to heat as much or as little of the surface as desired, and this amount of surface will be heated as long as those conditions exist. As may be conceived, such flexibility makes for steam economy, at the same time accomodating the needs of the occupant. To sum up the other advantages claimed for this system: The radiating surfaces are all effective heating surfaces, no part being air or water-bound; pressure can be reduced to that of the atmosphere, or below; a complete circulation is



A Compound Vacuum Steam Heating System.

secured even in the most distant parts of the system; all water-hammer in pipes is obviated; water drippings and disagreeable odors from air-valves are eliminated, and the coils and the radiators are thoroughly drained at all times. In case exhaust steam is used, the back-pressure on the engine or pump can be reduced to approximately zero.

Ralph B. Schmidt, Newark, N. J., has incorporated his plumbing business with a capital of $25,000. The incorporators are: Ralph B. Schmidt, Frederick E. Luttgens, both of 62 Ann St., Julia F. Hoch, 105 Central Ave., all of Newark, N. J.

The E. P. Hirst Co., New Bedford, Mass., has been incorporated with a capital of $10,000 to conduct a general plumbing business. The officers of the new company are: President, Eben P. Hirst, Fairhaven; treasurer, Winfield M. Bennett; secretary, Charles B. Chase; all of New Bedford.

Elgin Damper & Heat Regulator Co., Elgin, Ill., has been incorporated with a capital of $25,000 to manufacture heating specialties. The incorporators are: F. C. Guptill, M. J. O'Neil, E. L. Ryan.

QUESTIONS AND ANSWERS

HOW D. V.'S JOB CAN BE CURED.

Editor "Domestic Engineering":—In your issue of April 23rd, I saw a letter from a party in Hammond, Ill., who is having hot-water trouble. I submit a small sketch (Fig. 1), which has circulation below the boiler which is not practical, although this system, I believe, will work if it has the proper pressure placed upon it, as the job, sketched by D. V., was trapped in the 10-ft. length, and also below boiler, in which he might have used ⅛-in.

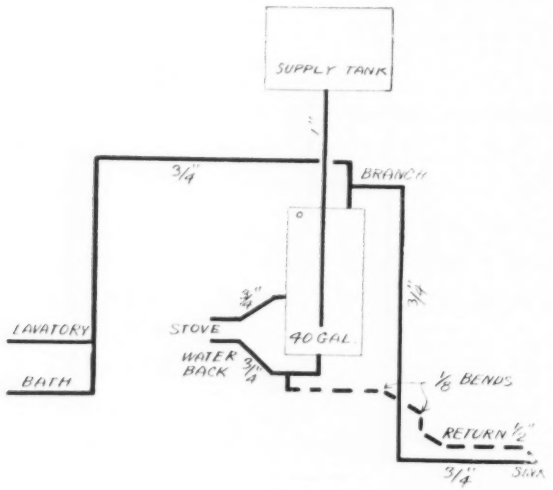


Fig. 1. How D. V.'s Job Can Be Cured.

bends, allowing the water to flow more freely. Should my system, as it is designed, not prove satisfactory, I would suggest connecting a gas water-heater near sink, but can see no reason for it not working without gas heater. I leave same for others to consider. I also wish to thank you for consideration shown me through your valuable "Questions and Answers" department.

Staten Island, N. Y. C. Birmingham.

ON "CINCHING" UP A PUSH-NIPPLE BOILER.

Editor "Domestic Engineering":—Recently, when setting up a steam boiler of push-nipple type, we had the misfortune to find that one of the sections was cracked. Do you suppose that the trouble was with us, or at the factory.

Atlanta, Ga. J. I. H.

In most of the cases we have seen the trouble has been with the fitter. The boilers sent out by reputable concerns are thoroughly tested before they leave the factory and in case the sections are damaged the trouble is generally with the fitter or the railroad company or a careless truckman. For that reason it is a good plan to test the sections by tapping them with a hammer before you accept them from the railroad. If this had been done perhaps you might have discovered that the section was cracked before you set up the boiler. If the fitter attempted to tighten up all the sections at the same time that is an excellent chance to crack one or more sections. The sections should be tightened up one by one instead of all at the same time.

QUESTIONS CALCULATIONS.

Editor "Domestic Engineering":—On page 222 of the June 4th issue of your journal, I think there is a mistake in the calculations of Mr. Pierce. "The factor per deg. of difference by table is found under 5 miles to be 1.02 B. t. u. per sq. ft. The difference between 60 deg. Fahr. and 20 deg. Fahr. is 40 deg." Should not this read the difference between 60 deg. Fahr. and 20 deg. Fahr. is 80 deg. Fahr.?

If the outside air was at zero and the inside temperature 70 deg. Fahr. and loss of heat 1.02 B. t. u. per sq. ft. of surface per hour per degree difference then $1.02 \times 70 = 71.40$ B. t. u.

If the outside air was at —20 deg. Fahr. and the inside temperature 60 deg. Fahr. and loss of heat 1.02 B. t. u. then $1.02 \times 80 = 81.60$ instead of that shown in text.

Sixty deg. Fahr. and minus 20 deg. Fahr. shows a temperature difference of 80 deg. Fahr.

Buchanan, Mich. Geo. M. Tait.

We submitted Mr. Tait's letter to Mr Pierce, whose answer follows herewith:

The paragraph in question reads as follows: "Any other temperature than 70 deg. and any wind velocity other than the average, can easily be made use of by multiplying the required factor in Table M by required temperature. Desired the heat loss from a window when the room is 60 deg. inside, outside 20 deg.; wind 5 miles per hour. The factor per degree of difference by table is found under 5 miles to be 1.02 B. t. u. per sq. ft. The difference between 60 and 20 = 40. Then $1.02 \times 40 = 40\ 8/10$ B. t. u. In practice this would be called 41". Mr. Tait asks if this "is not a mistake in the calculation of Mr. Pierce?" He then goes on to figure out the loss from — 20 to 60 deg. or 80 deg. The error seems to be on the part of Mr. Tait. The figures as given in the article are exactly correct for the temperatures indicated in the text. I assume that Mr. Tait, living as he does in the far north, where 20 deg. above zero is moderate weather for some months in the year, only gave a hurried reading of the article in question, and at once jumped to the conclusion that any illustration should be based on colder than zero weather. There is a very respectable number of the states of the union where the coldest that is specified for contract heating is 20 deg. Fahr. In these localities a very common practice is the calling for sleeping rooms to be at 60 deg. when outside air is at 20 deg. Fahr. In some sections also the wind dies down after midnight and in a very sheltered position as low a wind velocity as 5 miles an hour might prevail. This is a big country of ours and in writing for the steam-fitters of every section of it I have endeavored thus far to give illustrations that on very important things could be applied at any point. Mr. Tait, in his capacity of heating engineer, may be called upon to prepare specifications for some one living on the southern coast of California, or one of the Gulf states, or even some sections of the

Atlantic coast line where a condition similar to that given in the illustration will confront him. Then he will realize that the illustration on page 222 is not an error.

Belfast, Me. Edward R. Pierce.

THE OIL-BURNING PLANT AT SAN DIEGO, CAL.

Editor "Domestic Engineering":—I read with much interest and a great deal of profit the article in a recent issue of your paper in regard to an oil-burning plant installed at San Diego, Cal., by a firm on the western coast. I, and at the same time I am sure there are others, would like to see the fire-box and grate (or burner) arrangement of the boilers of that same plant, as it would be most instructive to the trade, and I trust that you may see your way clear to publish it before long in your valuable and interesting paper.

Chicago, Ill. "Steady Reader."

TO KEEP THE HOT WATER TANK FROM FREEZING.

Editor "Domestic Engineering":—I have a couple of hot-water heating jobs to put in houses this summer, and in each case it is desired to place the tank in the attic, where it is almost sure to freeze next winter. I wish you would tell me how to prevent this by illustrations, if possible.

Minneapolis. Subscriber.

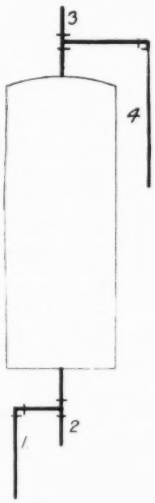


Fig. 2.

It might be possible to so enclose or pack these tanks that they would not freeze, but we doubt the wisdom of such a course. Probably the better way would be to connect the tank to the piping system in the manner which is illustrated by the drawing (See Fig. 2) given with this answer.

Pipe No. 1 should be connected to the flow-pipe while pipe No. 2 is hooked up to a return. No. 3 represents the vent, while No. 4 is the overflow, which can be run to the most convenient point.

HOW TO GET ANGLE MEASUREMENTS.

Editor "Domestic Engineering":—I wish, if you can find room for it, you would give me some easy way of getting the different angle measurements for such angles as 45, 60, 30, and less. Please print soon and oblige.

Minneapolis, Minn. New Reader.

For the benefit of our friend and others we print the ollowing table which has been represented as very easy and practical:

45 deg. (1/8) bend, multiply offset by 1.41
'0 deg. (1/6) bend, multiply offset by 1.15
30 deg. (1/12) bend, multiply offset by 2.00

This works out as follows: Suppose you have an offset that is nine inches long; now you are on 45 deg. work; multiply 1.41 by nine and you get 12.69, or a little better than twelve and one-third inches. That is the distance from center to center, from which, of course, you must take the allowance to be made for the two ells. The same rule applies to the two other angles, viz., the 60 and the 30 deg.

A HEATING JOB IN NEVADA.

Editor "Domestic Engineering":—Kindly allow me to submit the following problem to your readers. I have a job (Fig. 3) on which I am to install an American Ideal boiler with a capacity of 1,600 sq. ft. supplying heat to 1,400 sq. ft. of radiation. My live-steam or main-pipe is 8 ft. from the floor, the water-line on boiler 52 in. It is neces-

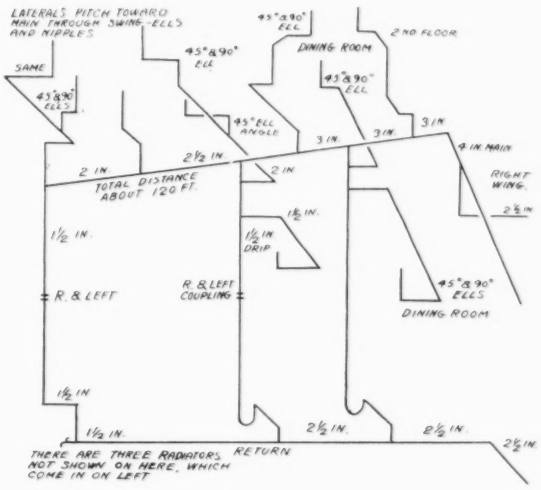


Fig. 3. Sketch of Heating Job in Nevada.

sary that I have a continuous drip from the boiler, owing to the conditions on the first floor, which is 9 ft. from the floor in the boiler room. The extreme distance of the system from the boiler is 160 ft. I am dripping at every other radiator into the return, which is supposed to be a dry return, as I cannot go down low enough to make it a wet return. When I do drip into the return, I seal the risers into the trap as shown in Fig. 4 with the exception

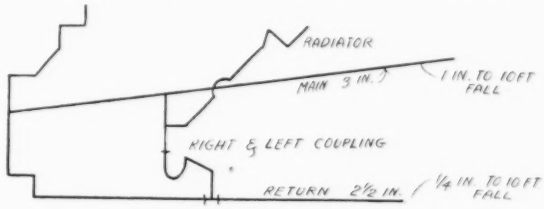


Fig. 4. How Risers are Sealed into Trap.

of the one at the extreme end. Now I would like to know if it is proper to seal the risers between the main and return or if the condensation is so great that steam would not travel in return. Would check-valves be of any advantage? If so tell me why they are better than trap or seal, and oblige. Yours truly,

Elko, Nev. H. Hanson.

HOW DOES THE AIR GET IN?

Editor "Domestic Engineering":—I never saw the following question in the columns of your paper and it is one that I should like to see published so that the readers may have a chance to see it and give their opinion. Take an ordinary gravity-return steam job that works all right. With the ordinary automatic air-valves it is easy to understand how the air gets back into the radiators. Remove the automatics and use tight pet-cocks

in their place. Pack every steam valve as tight as you can. Now get up steam and drive out all the air. Then let the steam go down for a while. When you go to get up steam again you have to go around and let the air out of the radiators once more. Now how did this air get into the system? Did it come in through the stems of the steam valves or did it work out of the water in the boiler? Please have some of your readers answer this question. Perhaps some of those who are posted on vacuum work can help me out a bit.

Des Moines, Ia. G. E.

We shall be glad to publish any answers.—Ed.

THE AMOUNT OF PITCH TO PLACE ON THE DRAIN.

Editor "Domestic Engineering":—Will you kindly tell me the amount of fall, or pitch, the main drain generally receives when it is desired to make a good job?

Omaha, Neb. S. D. K.

The fall or pitch used by some very practical men in the business and, we believe, also adopted by some of the cities of the United States, is that of one-quarter of an inch per foot.

WHY DID THE JOINTS START?

Editor "Domestic Engineering":—Some time ago I was called upon to look over a job where the air from the sewer got into the building and it was some time before I found the source of the difficulty, which turned out to be that the joints had all started, more or less, in the stack. Now can you or any of the readers suggest any manner of preventing this?

Cleveland, O. S. I. N.

We would suggest that proper allowance be made for the expansion and the contraction of the stack. This is a point which is, many times, entirely overlooked by the plumber when he puts in the work. One hindrance that is frequently put upon the stack is to mortar in the soil pipe solidly at the point where it passes through the wall. This is decidedly wrong as it binds the pipe at that point rendering it incapable of moving to the great damage of the wall, frequently.

RADIATION AND HORSE POWER.

Editor "Domestic Engineering":—Will you be kind enough to tell me in the paper how many feet of radiation that one horse power is equal to?

St. Louis, Mo. J. L.

We believe that, in tubular boilers, it is customary to figure for every horse power, one hundred feet of direct radiation.

HEATING THE WATER BY STEAM.

Editor "Domestic Engineering":—I have quite a large tank that it is desired to heat by using steam. Would you advise me to let the steam directly into the water or can it be done by some other means?

New Orleans, La. "630."

If it is an open tank and there is no objection to a certain amount of noise you can do as you have suggested. Otherwise it would be preferable to use a special steam nozzle which you can probably obtain from your jobber as you would in such a case have an apparatus which would give very little annoyance.

CHECK-VALVE ON COLD WATER SUPPLY PIPE?

Editor "Domestic Engineering":—Should a check-valve ever be placed on the cold-water supply pipe of a house job?

Little Rock, Ark. K. L.

One authority states that when there is danger of hot water being forced backward through the meter it is the thing to put on a check-valve. We should believe in so proportioning the apparatus that it would not do such a trick. When you put on a check-valve, unless you also put on some sort of safety-valve, you have stopped up the only means of the expansion of the water, other than the drawing of same from the faucets. In other words, you have then corked the job up tight and something may break loose at a time when not desired. We believe that we would not use the check-valve although some people may think it quite right so to do.

PIPE-SIZES ON HOT-WATER PRESSURE WORK.

Editor "Domestic Engineering":—Will you give me some information in regard to the sizes of pipe on a hot-water job where they make use of some of the apparatus which puts an extra pressure on the job?

Kansas City, Mo. "77."

We take the following list of sizes from one of the books written upon the subject and trust that the information will be satisfactory.

First floor, 1 to 30 sq. ft.—½ in.
" " 30 to 75 sq. ft.—¾ in.
" " 75 and over —1 in.

Second floor, 1 to 40 sq. ft.—½ in.
" " 40 to 100 sq. ft.—¾ in.
" " 100 and over —1 in.

Third floor, 1 to 50 sq. ft.—½ in.
" " 50 to 125 sq. ft.—¾ in.
" " 125 and over —1 in.

A comparison of these sizes with the open tank system will show the great difference in the size of the piping used in connecting up the radiators.

STEAM TRAP VERSUS PUMP.

Editor "Domestic Engineering":—Can you tell me which will do the work more cheaply, a pump or a steam-trap, on a steam job, on which the pressure sometimes runs to some seventy pounds.

Clyde, N. Y. D. J.

We are somewhat at a loss as there are so many conditions to be covered. If the job is a combined power and heating job (which we infer from the wording of the question), we also infer that the present method is wasting the condensation and it is desired to save same, in such a case we believe that the steam-trap will take care of the matter at a much less cost than a pump. At just how much less we can not say at this writing. Perhaps some of our readers may have had some definite experience along this line which they would be willing to send in for the benefit of all.

A PRACTICAL MANUAL OF STEAM & HOT-WATER HEATING

BY EDWARD RICHMOND PIERCE

SECTION XI.

RADIATOR-SURFACE REQUIRED TO OFFSET B. T. U. HEAT-LOSS.

As has been already stated the difference in temperature between surface of radiator and temperature of room determines the number of heat-units emitted from radiators.

When the manufacturers fixed the rating of house-heating boilers for steam at 2-lb. pressure at boiler, they sounded the death-knell for nearly all the rules published prior to that time.

The heating contractor of today is called upon to do better work than ever, and is very largely called upon now to keep within the 2-lb. pressure-limit called for by the boiler ratings.

When discussing the specific and latent heat of steam this was explained to some extent. Table FF shows the varying measure of heat in B. t. u. which is determined by the different pressures. It is now time to extend the discussion to the radiating of these heat-units from the various forms of radiators styled Direct, Indirect, and Direct-Indirect.

The direct radiators are most in use. It is assumed that it is not necessary to go into detail regarding them here, as each manufacturer of steam and hot water radiators gives in his catalog full and generally elaborate descriptions.

The one thing none of them give in their catalog is the value of each style and type of radiator in B. t. u. per hour under different temperatures.

It is not the purpose to advertise any radiator manufactured here, but when the time comes, as it must, that radiators are sold by their garanteed delivery under given pressure, of B. t. u. per square foot per hour, the price per cataloged square foot of surface will materially drop for some manufacturers. A radiator rated in catalog at 5 sq. ft. per section, which will deliver 240 B. t. u. per hour when filled with steam at 212 deg. and setting in a temperature of 70 deg., is worth more money to steam-fitter or owner than one rated at 5 sq. ft., which will only deliver 205 B. t. u. per hour when filled with steam at 212 deg. in same room. The former is worth at least 17 per cent more.

Today manufacturers ask about the same price for each representative pattern. All 38-in. two-column radiators are priced the same and so on through the list.

From what has already been said it can be seen that in dealing with this question and the present manner of rating nothing but averages can be given. Some manufacturers may claim the average given is low. It will simply be up to them to garantee that their goods will give more than the tables presented and then make their garantee good.

There is a difference between the value of single-column and two-column in value per square foot, and each additional thickness of mass or column decreases the value of the direct radiator per square foot of measured surface.

The B. t. u. emitted per square foot, as tabulated in this series, is based upon Standard Three-Column Radiators, as they have been found to average, unless otherwise stated. Some may do a little better, and some quite a bit less than the Table FF states as the probable value per square foot.

The simple rule for final sizing of radiator-surface for a given room is as follows, with 2-lb. boiler pressure, room 70 deg.

Rule for Sizing Direct Radiators, 2-lb. Pressure at Boiler.

Divide the total loss of heat from room in B. t. u. by 220 and result will show square feet of surface required.

Rule for Sizing Direct Radiators for Any Desired Pressure of Temperature at Boiler or in Radiator.

Divide total loss of heat of room in B. t. u. by the B. t. u. emitted per square foot of radiator-surface at the difference between room and radiator-temperature.

The B. t. u. emitted from radiators can be found by multiplying said difference by 2.5 for commercial pipe wall-coils; by 1.85 for cast-iron single-column, 1.65 for 2-column, 1.6 for most 3-column, 1.35 for 4-column cast-iron radiators.

The mean or average temperature of the radiators should be taken as 95 per cent of the temperature of steam at boiler. (Tables F and FF.)

To apply this rule, having 2-lb. pressure at boiler, the temperature of the steam is 219 deg., 95 per cent of that or 208 deg. will be the average temperature of steam in radiators; if the room is to be 70 deg., the difference is 138 deg. A 2-column radiator should emit 138 x 1.65 = 228 B. t. u. per sq. ft. per hour. A 3-column, 138 x 1.6 = 220 B. t. u. There are types of both two and three-column radiators offered for sale that will not give as good results as above; there may be others that will slightly exceed. I have tested 3-column radiators with rather flat tubes that only tested 1.4 or 193 B. t. u. per sq. ft. per hour. The fitter should require a B. t. u. garantee from the manufacturer of any cast-iron radiator, showing exactly what the heat emitted per sq. ft. per hour, at the pressure he will require, is garanteed to be. Then he will get what he pays for.

Sizing Indirect Radiators.

It is extremely difficult to secure satisfactory results from ordinary indirect surface when confined to the 2-lb. gage-pressure at which boilers are now rated, for the reason that the difference between the air entering the room from the radiator-stack and the room-temperature at 70 deg. is so small that the velocity of discharge is so reduced that it is very hard to get sufficient volume of warm air into a room. Again in using cast-iron extended-surface radiators, the air is splendidly heated and distributed, it is true in its passage through the radiator, but the average temperature is thereby made lower.

If iron pipe is used the mass needed at such low tem-

perature as 2 lb. at boiler deters one from getting results. In both cases the number of heat units delivered for room-heating purposes per square foot of radiator is less than would be delivered from same number of square feet of surface of direct radiators set up in the room to be heated.

To attempt to heat a room like that discussed for direct heating with indirect radiators and 2-lb. gage-pressure at boiler would probably end in some dissatisfaction on part of owner, unless he were willing to go to very considerable extra expense.

It is not well to attempt to place indirect heating for any room not provided with ventilating shaft to move the air sufficiently to secure a comparatively steady supply of warm air in motion. In fact, the attempt is likely to invite possible dissatisfaction or disappointment with indirect heating.

But as it is often required by house-owners who believe ordinary leakage sufficient for the purpose, the question should be discussed here.

As indirect heating is accomplished usually by the use of extended-surface cast-iron indirect radiators, it is well to remember that such radiators when cataloged by manufacturers very properly contain the entire surface-measurement of the material, extended as well as prime surface. Various manufacturers adopt different designs and arrangement of extended surface for their product, so that it is desirable always to ascertain, if possible, from the manufacturer the garanteed value of his radiator in B. t. u. at the temperature you intend to use.

Failing to secure such information it will, as a rule, be safe to figure the radiator for B. t. u. as worth from 70 to 80 per cent of catalog-value. There are, however, so many conditions upon which the net value of indirect radiators depend that actual test under conditions similar to those to be erected seems to be the only safe proposition, unless the manufacturer can furnish and garantee the B. t. u. which will be emitted each hour under required conditions, per cataloged surface of his material.

The tables given on the value of indirects are made up from averages from the results obtained from ordinary extended-surface radiators and will be found approximately correct for the better grade of indirects. The contractor who is to use indirect surface cannot afford to use any except the very best. He may be able to pass through a job of direct heating with cheap direct radiators, but with indirect heating he requires every possible fraction of advantage to be gained from the most efficient goods.

In all jobs of indirect heating where only natural draft is used, even if a flue for ventilation is provided, there will be exceedingly variable results obtained, for the conditions affecting the flow of air through the radiators and ventilating shaft change many times per day, and occasionally per hour. For instance, on a squally day the wind-velocity may run the range from an almost perfect calm to 20 or more miles per hour, within a single hour's time.

Indirect radiators furnish heat by conduction, therefore without forced circulation the velocity of air is low, and heating value less per square foot than with forced circulation.

Unfortunately, the tables mostly in use and the relative proportions given as between direct and indirect heating have, in this country at least, been based upon tests made when 60-lb. pressure was considered as within the range proper for house-heating. These pressures are given by Robt. Briggs as late as 1882 as being the base for the extensive tables he prepared. His tables are based on 10-lb. pressure in radiator and the use of 9.2 cu. ft. of steam per minute per 100 sq. ft. of radiating surface for direct heating, and from this as a base his tables are carried to 60-lb. pressure.

In 1895, when the Van Nostrand edition of Robt. Briggs' work with additions by Alfred R. Wolff was published, Mr. Wolff quotes Prof. C. A. Smith and the Dubuque Steam Supply Co., Dubuque, Ia., and gives a table which he says represents the results of the practice of these parties in indirect heaing. This table gives 25 per cent as proper increase in surface of indirect over that which would be figured for direct heating.—Van Nostrand Science Series, No. 68, pages 117-118-119-121.

Later practice reduced the working-pressures of direct steam-heating and a new ratio was established between direct and indirect surface by various writers and 50 per cent increase was decided upon as about correct. In the 1900 Edition of Prof. Carpenter's book on "Heating and Ventilation," pages 205 and 216, data is given for direct radiation at 10-lb. pressure, and for indirect radiation at 212 deg. in radiator and the ratio fixed for the first floor, steam heat, as 66 2-3 per cent. Now that the practice has become based on 2-lb. pressure at boiler for direct heating, a new ratio becomes necessary and it will be found desirable to increase the indirect surface over that required for direct from 85 per cent to 100 per cent, according to net value of indirect surface used. The boiler manufacturers of the more conservative type give notice in their catalogs "that when indirect radiation is to be used not less than 75 per cent increase over direct radiation should be figured in determining the size of boiler required." As we can see when the matter is fully explained this 75 per cent increase is actually the least that can be used with safety. A larger percentage of increase is necessary on some makes of boilers. Personally, I would advise an increase of 100 per cent in order to cover all the conditions liable to develop, including the fuel quality and quantity.

The conditions under which indirect radiators do their work are so completely different from those of direct heating that the manner of determining the heating value of the surface is for convenience also somewhat changed.

(To be continued)

BUSINESS CHANGES

S. Bryar, formerly of Cleveland, O., but now of Chicago, has just moved his plumbing establishment from 3209 Armitage Ave. to 640 East 47th St.

E. B. Homer, Lawrence, Mass., has sold his plumbing business on Broadway, in that city, to J. R. Tetler. Mr. Homer has conducted this plumbing establishment for 35 years at the same location.

The plumbing firm of Percy Williams & Co., Oconto, Wis., has moved its establishment into the Nelson building at 216 Park Ave. A large portion of the building will be used as a display room while the remainder will be used as a workshop.

C. E. Grenier, who has conducted a plumbing establishment at Amesbury, Mass., for some time past has been succeeded by Donovan, Smith & Co. Both men are well known in Amesbury, Harry Smith being the practical plumber of the new firm.

S. G. Jordan has purchased the interests of his partner C. E. Koblenz in the plumbing and heating business now conducted under the name of S. G. Jordan & Co., at Mendota, Ill.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD

SOME QUESTIONS ON BUYING GOODS.

We have had several letters from time to time in regard to the matter of handling the proposition of buying. Now we should very much like to bunch the lot in a few general questions and hear from a few of our many readers who are from time to time giving evidence that they are following the pages of this department with interest. Here are the questions:

1. All things considered, is it best to buy where you can buy cheapest?
2. Is it better to buy from one house or to divide the trade?
3. Do you believe in loading up on bargain sales?
4. Is it better to buy for cash or to take a reasonable amount of credit, provided you are a good responsible man?
5. Do you figure to keep a certain per cent of your capital invested in stock, if so what per cent? Or do you find it a better proposition to buy for each job separately? Can you prove it? Please do so.
6. Have you any system at all in regard to purchasing your goods? If so can you not give out a few general tips for the benefit of the man who needs to become a better business man?
7. Have you ever thought far enough ahead to find out how long it took the stock to "turn itself," can you give us any pointers on the matter? About how much of the stock has laid in the shop for the past year?

We should like to have anyone, or all, of the foregoing questions answered by our readers. Please state facts as briefly as possible. Ideas are what we are after and not speculations.

THE PRICE CUTTER.

Editor "Domestic Engineering":—What is a man to do when he has to come constantly against the bids of a price cutter who knocks the bottom out of everything? How can a man get along and see job after job go to the competitor and still stay in the business? Answer or please print and let us see what others seem to think about it.

C. L. G.

In the first place, friend, are you sure that you have your own business to a point where you can do the work at the very best advantage?

We would suggest that you first look into the matter very carefully and see if there are not a few loose places in your shop and your business that have escaped your notice. Isn't there some place where you can cut down the expenses so that you can do business at a less cost?

If your competitor has been in the business for some length of time and still has the lead and apparently does not seem to do the proper thing (either die or go to the wall) it would seemingly prove one of two things, viz., that he has a goodly pile in the bank to draw to, or else to state it in very plain words, he is the better business man.

Now if he is yet young in the business and you are sure that you have the proper data on your own affairs, and are not guessing at the matter why would it not be a good thing to pay this competitor a friendly visit some day and talk matters over and see if you could not come to some understanding in the matter? If he is a true mechanic he will be apt to be somewhat set in his opinion, but then what of that? You are undoubtedly blessed (?) with more or less firmness yourself and so the balance would be even. A little tact and some good, plain, common-sense talk between the two of you, and perhaps matters might be adjusted. It might be that it would develop that each could get some good points from the other. It would do no harm, at least, to try in the matter.

HOW SOON SHOULD COLLECTIONS BE MADE?

Editor "Domestic Engineering":—I see so many very interesting points in your new paper that I would like to butt into it a little myself.

Would you mind printing this letter and requesting answers from some of the readers? I would like to ask that some one state what method he uses to get the money back into the shop or business, as I suppose you would call it.

If no definite time for the payment is stated in the contract (and sometimes you know there is no contract at all) what is the usual time to let the account run? Thirty days, or take it when you can get it? If any one has got a good scheme along this line I, for one, should be most mighty glad to see it.

Omaha, Neb. C. J. R.

CIVILITY A DIRECT ASSET IN THE BUSINESS.

Editor "Domestic Engineering":—I see a great many good points in that department of your paper called "Business Management" and desire to add my little to the mass of good that is being done. I have tried for years to be as civil in all my dealings as is the man who stands behind the counter and I endeavor to impress the same thing on all my men who do the work. I require them to be polite, do their work as neatly as possible and to conduct themselves in such a manner that the householder will send for the same man to do work for him (or her), when another job is to be done. It pays and in no small amount, either. The shop gains a good name and the work is more satisfactory. "Molasses goes further than vinegar." It's an old saying, but one that is true every time. Try it out and see.

Pittsburgh, Pa. L. A. H.

WHAT ABOUT THE MAN AGED "40."

Editor "Domestic Engineering":—Only the other day the writer of these lines happened to be talking to one of the visitors at the meeting of the National Association of Master Plumbers in Chicago and in discussing a position to be filled the writer happened to mention a man who was about 43 years of age. "Oh, hadn't we better get a man who is a bit younger?" the visitor remarked. Now, what I would like to know is how many first-class heating

engineers, estimators, or even master plumbers there are who are under 40? I stood and looked down (from the gallery at the convention) at the many bald and grey heads there and I should put the average age of those present at beyond 40. Does a man get judgment and wisdom at our business before arriving at that age? Let me hear from some of the many in the business.

Chicago, Ill. A. B. D.

SANITATION AND WATERWORKS IN SOUTH AMERICA.

One of our many subscribers, who seems to be looking ahead, writes us for some information in regard to sanitary matters in South America. There seems to be somewhat of a scarcity of information in that respect, but we can say that probably the most progressive city of the South American land is the city of Buenos Aires in Argentine. This city is said to rank nearly with Philadelphia in size, and it compares, favorably, in many ways with the other large cities in the world. The sewer system and the water supply are maintained by the National treasury and the service is claimed to be equal to that of any city of its class in the world. The water for the city is taken from the Plate river at a considerable distance above the city so as to guard against any chances of pollution, the supply coming from wells which were driven beneath the surface of the river and the water is pumped through tunnels to the city where it is distributed from a central station, after being filtered and the sediment removed. We know too little about this great country which is growing up to the south of us and which must, some day, be reckoned with as one of the factors in the trade of the world.

ON CONTENTMENT.

"The toad beneath the harrow knows
Exactly where each tooth point goes;
The butterfly upon the road
Preaches contentment to that toad."

And the toad was apparently contented, for we have not yet been informed that he ever got out of the rut. The average plumber has been moving along in a rut, well worn, for years and years, but there are signs of an awakening at last, and one of them may be seen in the establishment of this very department.

It is safe to say that 20 or 25 years ago such a department would have been regarded with distrust; to-day it is meeting with a direct and appreciative response from many quarters. When a man clings to the rut he really moves backward. That may seem to be a little mixed, but please remember that the observing man is going ahead while the other is making no progress.

The plumber must not only perfect himself in what is best in the craft and business as it exists to-day; but he should be on the lookout for to-morrow. Study and thought are certainly needed in the business both now and in the future. We need more good men in this business both for the perplexities of the present and the problems of the future. Any one can start now to make good in some of these places; the years to come will tell the story of the finish.

To few of us is given the chance to have a world-wide experience or the chance to make a country-wide series of observations. We can, however, make the success and mistakes of others a study and then apply as much or as little as will be of benefit to our own case. This can be done by reading the different books, papers and magazines that can be obtained at a nominal cost. Speaking in a general way, the thoughts of the plumber, as a class, are confined by too limited a circle. He is not overanxious to know what exists beyond the "outer rim of his present horizon." Therefore he stays in the rut, a plumber once and a plumber always, and sometimes a blamed unsanitary one at that. There has never been a problem presented in this department which the average plumber once and a plumber always, and sometimes a and think. Perhaps he might not present a good solution to-day, but that ought not to hinder him from throwing in a "solar plexus" blow in six months from to-day, and if he is not interested in the advancement of both himself and the business by which he makes his living in this world he is an impediment to progressiveness and he is a pretty useless piece of furniture.

Such a man could not sell bananas and make a success of it. The party, who is filled with contentment and who is satisfied with what he knows, and who is so one-sided that he reads only what he likes or what he believes in (or doesn't read at all), is the party who is going to stay in the same old rut forever.

The party, who starts some investigations of his own or tries to think up some different points in the game, is the man who will improve. He may (and probably will) make some mistakes, create enemies and surely will be laughed at many times, but he will have the satisfaction of knowing that he is better fitted to meet the needs of his business, both present and future.

He will have a more charitable spirit for all, and the chances are that the reward will come to him in both the dollars and the appreciation of the community.

COULD NOT THE PLUMBER START A HARDWARE BUSINESS?

Editor "Domestic Engineering":—I have read in your paper many times of how the hardware man goes into the plumbing business, sometimes with the greatest of disaster to the plumber. Now I wonder why it would not be a good plan for some of us plumbers to go into the hardware business and meet these fellows on their own ground. If they can make money so can we. Not every hardware man is a prince of finance by a long shot, and if they can hire a man to estimate plumbing and heating for them for, say $100 a month, why can't we hire a good man who has a knowledge of the hardware business to run that part for us?

A small stock of shelf goods would do to start in on. We generally have to have some one around the shop anyhow, so why not pay a little more for such a clerk and get a man who could sell goods? I hope that you will print this letter, and that it may interest some of your readers enough so that they will answer.

Kansas City, Mo. N. W. E.

The McCusker Co., Portland, Ore., has been incorporated with a capital of $20,000, to conduct a plumbing business. The incorporators are: Joseph McCusker, R. W. Wilbur and S. C. Spencer.

D. H. Budd has sold his interest in the plumbing business of Reeder & Budd at Bozeman, Mont., and has opened an up-to-date plumbing and heating establishment under his own name in that city. He has started business in earnest by landing the following contracts: Heating E. B. Martin's business block, $5,750; plumbing the same building, $2,275; remodeling Wilson Co.'s heating plant, changing it from a hot-water to a steam-heating plant, $3,000. He also has secured the contracts for plumbing four new residences. Mr. Budd is secretary of the Montana Master Plumbers' Association and one of the best known men in the plumbing trade in Montana.

A PLUMBER'S DIARY

BY PHOENIX

V.

July 14.—This morning I got up feeling fine, ate my breakfast with Jimmy and we went out to the job. Hadn't more than got the tools out and my overalls on before the "boss" showed up, and the way he went for me was a caution.

He ripped around and cussed until he was unable to talk at all and sure did make up for what he had left unsaid before. He was one of the kind that have a head under the hat only and not a blamed idea. I saw a kind of sneer on the face of little Jim as though he sort of wished that he was in the game, and I knew right off the bat what to do? So I walks up to the old rooster and hands him a good one that lifts him clean off his pins, picks up my coat and leaves the job.

Never have seen that boss or town since, and don't want to either. There are some that will say I was in the wrong, there is also an old saying about patience ceasing to be a virtue. At any rate little Jimmy patted me on the back and said "bully boy, you served him just right." So that night Jim and I packed up our little bundles and drifted out making for Buffalo, N. Y.

July 16.—Got into this blooming city of the Empire state and am not going to stay here long. We looked around the town some to-day, but the old cry of "nothing doing" greeted us on all sides. We walked out on Delaware avenue a ways and it certainly did look fine. May be sometime I'll have a swell house like some I saw to-day myself. Likely prospect for a floating plumber, isn't it? There being nothing else to do Jim and I went down to that refuge for the jobless, the Public Library, and proceeded to pass a few hours in reading the papers and magazines. There were a whole lot of fellows sitting around there reading who didn't look a bit better off than we were, and so we did not feel lonesome at all. Pretty soon I got tired, and as it was getting late in the afternoon I says to Jim, "Let's get out of this and mosey down around the "N. Y. C." and see how things look." On the way we passed several "scalpers'" offices and I saw some mighty cheap rides to Chicago advertised. "What's the matter with riding the cushions," I said to Jim. "Have you got the price?" he answered. "Maybe, I'll see though," and we went around the corner so I could count my money.

I had been saving up the plunkers for a while back and the car-fare up to date had been free. I found that I had money enough and so went back and by good luck got a couple of pasteboards over the same line for us both.

"I'm going to have something to put these bundles in and go into the 'windy city' in better style," I said to Jim, as we walked by a clothing store. It wasn't the swellest clothing store in the world. One of the kind where the fellow stands outside and sees you coming and sizes you up meanwhile. So when we got in range and he yelled "trunks, grips, telescopes." I fell for it and going into the store I bought a "swell" telescope for about $1.48, and in it we put our all, in the way of clothing and hiked down to the station.

About eleven o'clock that night our train was called and we got aboard making for the smoker, where we got a good seat. It was a mighty hot night, the car windows all open and the cinders came in freely. Still it was a whole lot better than riding on the baggage or on a freight train and never knowing when nor where you were going to be kicked off. So after a while we managed to make ourselves fairly comfortable and got some sleep.

Seems like I got four winks of sleep, when Jim hunched me in the ribs and I woke up. It was nearly half past eight in the morning, and we were well into the big and windy city, the first time that I was ever there. I jumped up and put on my coat and looked for my telescope. Yes, it was there, and for months and months after I was unable to lose the blamed thing. Well, we found a place to wash up and went out and got some "sinkers and coffee," after which we started out to take in the town and see in which way we would hit, for neither of us cared to get a job in the big town at this time.

As we were passing along State street I bought a morning paper and turned to that friend of the distressed, the "want ad" column and under the head of "male help wanted" I found this:

"WANTED: two steam-fitters at once. Public job. No trouble. Wages $3.50 per day."

Jim looked at me and I looked at him and we both say "that's it." Then I once more look over my change and we got to the depot to see how much the fare is, and I find that we can make the town (which is not so very far down in the state) and have left the price of a bed for the night.

Therefore the late sun of a summer's afternoon (get next to the Shakespeare?) falls slantingly on the train which bears us to the dollars waiting us in exchange for our knowledge as steam-fitters, always supposing that some one has not got in ahead of us and landed the job.

We pulled into the town a little after dark and soon found a place to sleep for the night and hit the hay, for we wanted to get up early and be on the job so as to catch the boss the first thing, and from what we could see of the town it looked like nine hours a day to us.

J. C. Smith Plumbing Co., College Hill, Pa., has been incorporated with a capital of $5,000 to conduct a plumbing business.

The Arid Heating Co., Chicago, has been incorporated with a capital of $2,500. The incorporators are: Ignatius Beckman, L. J. Delso and Samuel B. Falk.

The Logansport Heating Co., Logansport, Ind., has been incorporated with a capital stock of $125,000. The incorporators are: Carl S. Wise and Frank M. Kistler, both of that city, and Bert Wills, E. C. McMurty and Markwood Splicer, all of Frankfort, Ind.

Domestic Sanitation*

By Thos. Hughes, R. P., of Warrington.

It was in the year 1365, during the reign of King Edward III., that this most important subject appears to have received any very serious attention. At this time it is on record that an effort was made to secure better conditions regarding the plumbing and sanitary work of dwellings. A little later in the same century a law was passed to prevent the pollution of rivers.

Since then there have been Royal Commissions. Parliamentary Committees, and inquiries of all kinds centered round this subject of sanitation; yet with all this, when we come to look about us, we still see rivers as black as ink with the liquid waste and filth which finds its way into them, and dwelling-houses deficient and imperfect

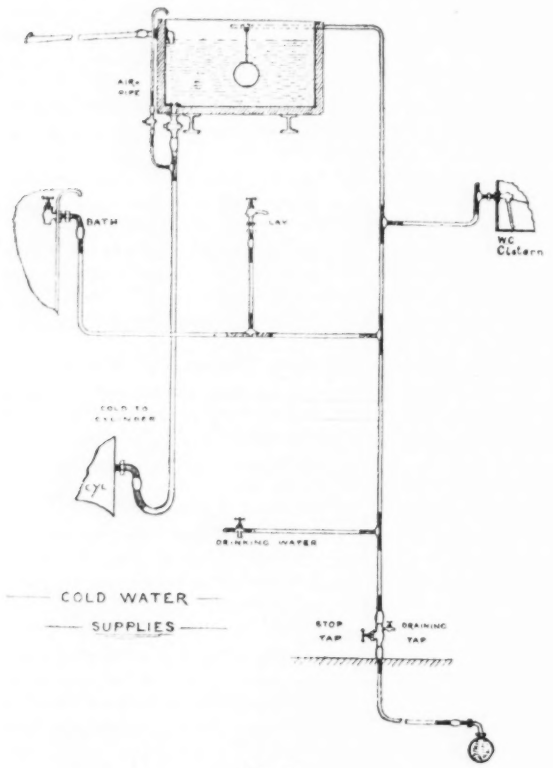


Fig. 1.

in their drainage, sanitary arrangements, and water-supplies.

It is the plumbing and sanitary work of dwelling-houses with which I am chiefly concerned to-night, and I purpose showing you some illustrations of how this work can be carried out simply, efficiently, and without great expense.

In the first place I shall assume that there is an ample supply of good fresh water to be obtained from the town-supply-mains, and that foul water-mains or sewers are provided to take away the contaminated water; and that all the work, from the laying in of the fresh water to the house and its subsequent removal to the sewer, constitutes the plumbing and sanitary work practised at the present time.

Commencing now with the fresh water-supply. The first illustration (Fig. 1.) shows the method by which many water-authorities require the internal distribution of the water to be effected. All the branches to fittings, such as baths, lavatories, sinks and water-closet cisterns, are taken direct out of the service-pipe from the town's main. With a constant supply of water and good pressure, this method is considered to meet all the requirements of good sanitation. The plumbers' work shown here may be of the best, having good wiped solder-joints—no other joints on lead-pipes can remain tight—all the pipes exposed and accessible, and protection against frost-burst provided by practical means, consisting of simply turning the water off and drawing out the contents of the pipe; still, the principle is objectionable, and under some circumstances allows of contamination of the fresh water-supply.

If any of you have watched the behavior of a pressure-gage fixed on one of the higher branch-pipes you will

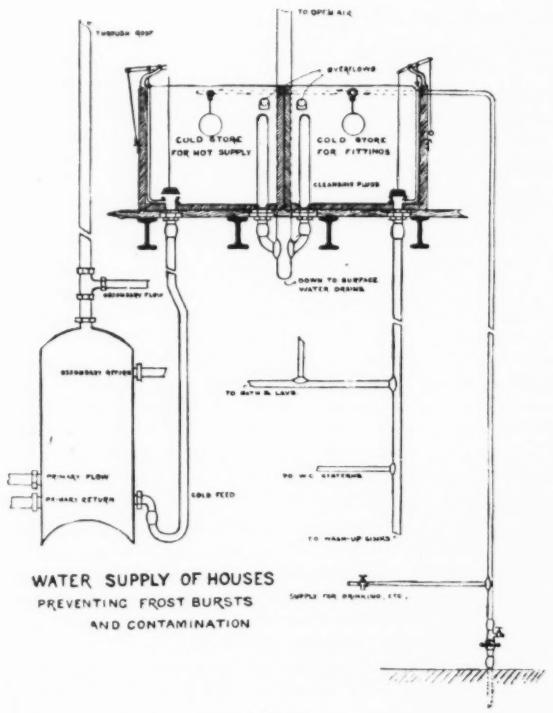


Fig. 2.

have noted that excessive fluctuations take place in the pressure, occasioned when large amounts of water are being drawn off at lower levels; and if the quantity being drawn off at these lower levels at any time is equal to the delivering capacity of the water main, then all these upper-level fittings become inlets for air into the fresh water-pipes.

Now you must see that air drawn into the pipes from water-closet compartments, out of baths, lavatories and

*An illustrated lecture delivered in the Technical School, Ashton-under-Lyne, England, on December 9, 1909, under the auspices of the Manchester Council for the National Registration of Plumbers. Reproduced by courtesy of "The Plumber and Decorator."

sinks, cannot be regarded as free from impurity, and I rather imagine people would not appreciate drinking water charged with air from such places.

It is with a view to prevent such an occurrence that the second diagram (Fig. 2) has been prepared. You will notice here that only one branch is taken from the fresh-water service pipe—and this at a low level—for drinking and cooking purposes. The fresh water supply is then carried on to the cistern room, where two store-cisterns are fixed—one for the hot supply and the other for cold to all fittings. This cistern room is ventilated separately from any other part of the house, so that if an in-suction of air now took place it would be practically pure air.

The arranging of the internal supplies by the method indicated in the diagram would ensure an equal and constant pressure at all points in the hot and cold service throughout the house. The pipes and taps would not be subject to fluctuating pressure stresses, which would mean less bursting pipes and tap repairs. Also, air cannot be drawn out of baths, water-closet compartments, lavatories or sinks, into the fresh-water pipe, so that contamination risks are reduced to a minimum.

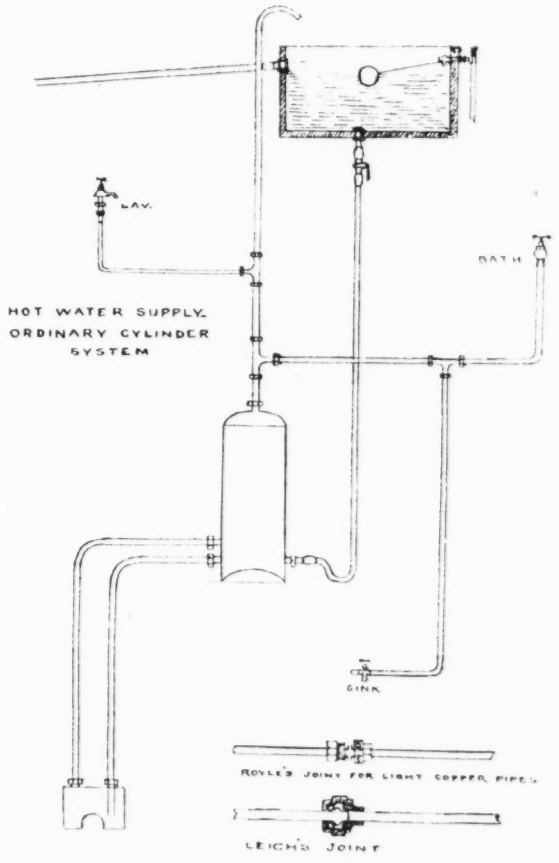


Fig. 3.

I have also shown here another method of guarding against frost-bursts. Instead of the usual stop-tap under the cistern I have shown a dead-weight valve with air-pipe. On dropping the valve, air can enter the pipes and the whole of the water can be drained out at the taps. When the valve is lifted the air-pipe is closed, so that no risk of getting pipes air-bound need be feared.

I think practical measures of this kind a much better safeguard against frost-burst than wrapping pipes with non-conducting materials, most of which furnish a happy hunting-ground for bacteria and vermin.

Passing along now to consider the hot-water supply of houses. I have illustrated by Fig. 3 the ordinary system of cylinder-supply, and whilst this is certainly a great improvement upon the older methods, I think there is much room for future development. In the first place, a more permanent character would be given to the work if all pipes which convey hot water were of copper. To use copper pipes of a strength sufficient to allow of screwed

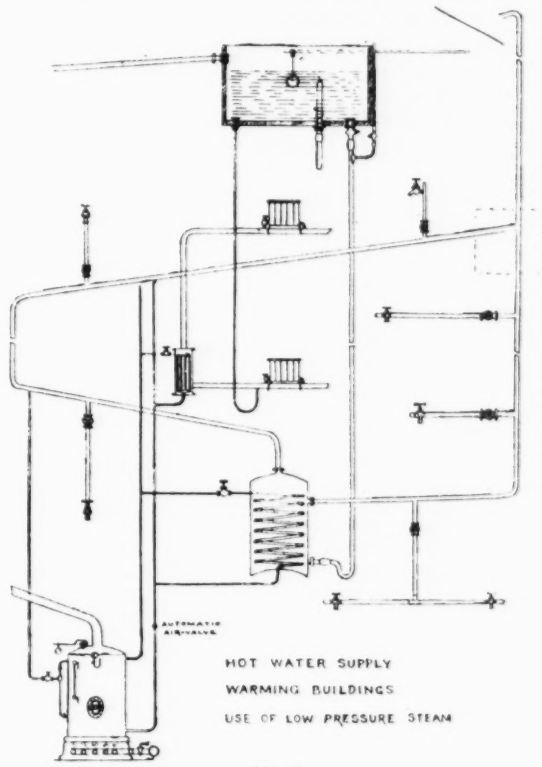


Fig. 4.

joints being made involves considerable expense, and really it is hardly consistent to put in cylinders made out of sheet copper, say, 1-16 in. thick, and connect pipes to them ¼-in. thick. There is not the slightest need to go to this expense, because copper being tough, tenacious, and a true solid, we can make joints on the pipe by pressure.

It is the jointing of this copper pipes that has always been the difficulty, and that is the chief reason why they have not been put into more general use. You are doubtless aware that the method of joining these pipes was by soldering brass unions on the ends, or soldering the pipes into screwed couplings. After a very short time they would be found to leak at the joints, owing to an electrolytic action taking place between the copper and solder, and the strain caused by the unequal expansion and contraction of these metals when being heated or cooled.

This jointing difficulty on light pipes can be overcome by using either Royle's or Leigh's compression-joints, both of which make excellent connections.

You will recollect that previously I said none other than solder joints could be made reliable on lead pipes.

I had in my mind then the fact that many instances of compression joints on lead were being used; and although they may be tight when newly made, it is a certainty they cannot remain tight for very long. I venture to say that a scientific plumber, knowing, as he would, lead to be a true liquid under pressure, there cannot be any hope of such joints being permanent, and therefore he would not use them.

Whilst this cylinder-system will answer very well for houses requiring no more than the usual bath, lavatory, and sink supply, it is certainly not quite satisfactory for larger premises; and the next illustration (Fig. 4.) is intended to offer some of my views respecting these.

Allow me first to explain that in the previous system, where the boiler is fixed behind the kitchen-fire, far the greater part of the heat goes away up the chimney in the form of smoke; that repairs or cleaning of the boiler necessitates the pulling down of brickwork and portions of the grate; and that sometimes this might be the cause of a little anxiety. There is, however, no need of much anxiety if it has been fitted up by a registered plumber.

To return to the diagram. I have shown, in place of the boiler behind kitchen-fire, a small gas-heated multitubular steam boiler, for giving a supply of low-pressure steam, say from 5 lb. to 8 lb. per sq. in. pressure. This pressure would in many cases be much less than the pressure of water alone in many back-boilers. It is provided with a safety-valve and means of supply. From the boiler, steam is led off by a small pipe to pass through a coil placed in the cylinder. The steam gives up its heat to the water in the cylinder, and condensing, drains away to the boiler to be converted again into steam. The same water being used over and over again, little or no incrustation will take place in the boiler.

Further up the diagram I have shown how buildings could be warmed by a similar process—indeed, by using a branch from the same steam-pipe and connecting it to a small calorifier to warm the low-pressure heating pipes and radiators on any floor.

I will now try to show you some of the advantages of such a system. First, you could utilize nearly the whole of your source of heat for obtaining steam; secondly, you would help to keep the air of towns much purer by not pouring into it large volumes of unnecessary smoke. You would in a large measure be preventing the presence of fog, which Sir Oliver Lodge tells us is occasioned by smoke particles or very fine dust becoming surrounded with water vapor. These dust particles are so fine that a Scotch scientist, Mr. Aitken, tells us that every puff a cigarette smoker sends out adds 4,000,000,000 of them to the atmosphere!

Again, you could get out of every pound of steam condensing 996 B. t. u. of heat, each heat-unit being capable of raising the temperature of 1 lb. of the water in the cylinder 1 deg. F.

Next, there is no risk or danger with such an arrangement. The distribution of the hot water to the fittings consists of a circulation passing close to each fitting, to which a branch is taken, and on it a control-valve is placed to enable repairs to be done without closing off the whole supply. If there are many floors and a great number of fittings, a hot store-tank on the highest point of the circuit could be put in, as shown by the dotted lines; the object of which would be to give an ample supply to upper level fittings when a great deal of water was being used at lower levels.

(To be continued.)

OBSERVATION, APPLICATION AND ASSOCIATION.*

By L. J. Butler, Grand Rapids, Mich.

The lesson constantly taught us by experience in business and by association, directly or indirectly with others, not only in our own line but in other lines which necessarily come in contact with ours, prove conclusively that the active field of the plumber is broadening to the extent that the master plumber of to-day and of the future must place himself shoulder to shoulder with the new conditions, both in regard to improved sanitary appliances and the business methods necessarily being developed along modern lines. No matter how well established one's business may be, we must observe, and observe diligently, the methods of other men in our own line of business and also the methods of men in other lines, and we must apply as best we can that portion of the other fellow's methods which prove to us that they are worthy of our consideration and can consistently be applied to the conduct of our business and help in making it a credit to ourselves and our services more valuable to the community.

We must also keep in mind that others in business have the same right, and are forced by the same existing business conditions to observe and apply the good points brought out by us as individuals. In this connection let us make "Observation and Application" of the many useful and valuable business and mechanical points that can be and are evolved, discussed and made good use of through the medium of our various associations, and our local, state and national meetings. Thereby valuable knowledge is diffused among us in a way that enables us to ponder over the best ideas of our friends and competitors, and to assimilate and to apply to our own use the hints most valuable to us.

We must observe the fact that people of to-day are learning to look upon the plumber from a different standpoint from that of some years ago, and when we review the years that have gone, we cannot help noticing the evolution that has taken place and in asking ourselves why, we must necessarily observe that much of the improvement, both in material, appliances and business methods, has come about through our observation and our application of the lessons well learned thereby. We must also recognize that in no other way can we so easily and so successfully keep ourselves abreast of the times and keep our business on a plane that the public must respect, than by the constant application of these principles to our everyday business conduct and to our associational work.

Let us apply to our business, each and every day, the very best there is in us, as mechanics, as business men, as members of the community and then think and see for ourselves if observation, application and association have not made us better individually and collectively. Then, when next year's state meeting-time comes, let us have it already proven in our minds that the association is doing much for us. Let us again come together with a firm belief, well founded, that it is worth our while. Let each be prepared to do his part toward the advancement of the plumbing trade to the rank it deserves and which it has so nobly earned among the foremost trades of to-day.

*Essay read at the 18th annual convention of the Michigan State Association of Master Plumbers, held at Jackson, Mich., Mar. 30 and 31, 1910.

SEWAGE DISPOSAL OF THE INDIVIDUAL RESIDENCE, COUNTRY HOME AND CAMP.*

By H. B. Cleveland, Principal Assistant Engineer.

The methods of disposing of sewage from isolated houses, country residences and camps in such manner that insanitary conditions shall not occur or that contamination of soil near dwelling places or pollution of streams or well waters shall not take place, will depend largely upon the local conditions as to soil, the area available and general topographical features.

In rural surroundings, especially at temporary camps in the woods, too often little or no care is taken to prevent the pollution of streams by excretal wastes washed over the ground surface. The proper disposal of such wastes may, in some cases, be just as important in its relation to public health and sanitation as the disposal of sewage from a large community. In isolated locations or at camps where plenty of area is available, temporary privies may be constructed over pits and the structures moved to different locations when necessary, the pits being filled with earth when the privy is moved. At permanent country homes, where a running water-supply is not used, these privies are necessarily more permanent and the vaults, if located at proper distances from springs or streams, may be cleaned from time to time and the contents buried. Owing to the location of such vaults in certain cases, however, it may be necessary for the vaults to be watertight or that portable watertight receptacles be employed for the convenient removal and proper disposition of the excretal wastes.

With cottages on lakes, or farmhouses, or even with houses in villages, when such homes are provided with running water but not with sewerage facilities, the problem of disposing of the liquid wastes from kitchen-sinks and inside closets is often adequately met by the construction of the ordinary dry-walled cess-pool. The conditions for properly caring for sewage in cesspools are that the soil on the premises be exceptionally well drained, loose and well ventilated; that the ground water-level be fairly deep with reference to the surface; that there be sufficient area to prevent soil-contamination near the dwelling and adjacent to the cellar walls; and that there be no danger of a contamination of the springs and wells. The possibilities of this latter danger may be determined by a study of the surface slopes, of the direction of ground water flow and of the fissures in the rock formation, if underlying rock occurs.

Very often a series of cesspools is dug so that in case the contents of the first cesspool, owing to the compactness of the soil, do not readily seep away, the overflow may be carried into a second or even into a third. In this way the natural filtration-area afforded by the bottom and sides of the cesspool is increased, and it is, therefore, often possible to dispose of sewage in a sanitary manner in soils not naturally best suited for such a means of disposal.

Attention should be called to the desirability and necessity of preventing pollution of streams by drainage from barn-yards and manure-pits, especially those streams used as sources of public water-supply.

While no danger exists of actual infection from contamination of this nature, considered by itself, except in the case of a very few diseases common to both man and beast, the pollution of streams by barn-yard drainage is not only likely to produce conditions of nuisance in the stream but may be the means of allowing infected human excreta to reach the stream.

Care should be taken that such drainage does not reach the stream; barn-yards should be located well back from the watercourses; neither manure nor compost containing human excreta should be allowed to accumulate or be spread upon the ground surface in such locations that the drainage will flow directly to any stream; and when necessary, manure-pits should be made watertight.

Referring again to the disposition of household sewage, when the soil on the premises is close and impervious, or when for certain reasons a watertight cesspool is required, making burdensome and expensive the frequent removal of the contents, the method that may then be adopted is to pass the sewage through a septic tank or settling basin, with some subsequent treatment of the effluent such as filtration through sand or its distribution through the soil by means of a subsoil irrigation system.

Where it is only necessary to prevent the gross pollution of streams by removing the suspended matters from sewage and when the quality of the water in the stream into which the sewage-effluent is to be discharged need not be protected for water-supply purposes, a septic tank or a settling tank only may be installed, provided there is sufficient flow in the stream to properly dilute the effluent. The capacity of such tanks should allow for a detention of the sewage, if from private residences, for periods ranging from 12 to 36 hours, depending on the amount of water-supply and the fluctuations in the flow of sewage. They should be watertight and should have a depth of five or six feet and a width of at least four feet.

When, however, as frequently occurs, it is necessary to provide for more complete treatment of sewage than is possible in septic tanks or sedimentation-basins because of the limited flow in the stream into which the effluent is to be discharged or on account of the use of the stream as a source for potable water-supply, the effluent from the septic tank or from the sedimentation-basin should be further treated by filtration through the soil; by intermittent filtration through natural or artificial beds of sand; or by treatment on beds of broken stone, coke or other similar material arranged either as contact-beds or percolating filters.

The successful operation of a system of subsoil drains depends almost entirely on the character of the soil. Sand is the best filtering medium, but a light, sandy loam or a gravelly soil will care for septic-tank effluent.

The effluent from the tank should generally be collected in a discharging or siphon-chamber, so that it may be discharged intermittently into the subsoil piping-system.

The intermittent discharge from the siphon or dosing-chamber is delivered into agricultural tile-drains or sewer-pipe laid with open joints in parallel lines one foot or so under the ground surface.

The absorption-area selected is generally on a slope, with the main-tile drain discharging into branches which are laid at right angles to the axis of the slope and parallel with the contours.

In some soils it is necessary that the main-effluent carried shall be laid with cemented joints in order that the effluent may be turned on alternate days into different sections of the subsoil system. If the absorption-area is naturally well-drained, the effluent will seep away into the soil and need no further care. But it is sometimes necessary to prepare the area by constructing underdrains beneath the

*Reproduced by courtesy of the New York State Department of Health.

subsoil system, or blind ditches or drains around the lower sides of the plot.

The total length of subsoil-piping is dependent on the porosity of the soil. The length in each section of subsoil-piping into which the dose from the dosing chamber is to be discharged, may be somewhat less than that required to receive the full dose, since during the discharge some of the effluent escapes through the open joints of the piping.

In general, the problem of disposing of sewage from individual residences is somewhat different from that of municipalities, and the design of such individual plants must vary somewhat from the design of the municipal plants. This is due to differences in the character and relative amount of sewage to be treated, to greater fluctuations in the rate of flow of sewage and to other local factors relating to soil conditions and topography.

Where the problem of disposing of sewage from individual residences is at all difficult or complicated, owing to unfavorable soil or topographical conditions, lack of sufficient area, or the necessity of protecting supplies of potable water from contamination, expert advice should always be sought in order that the scientific principles of sewage purification may be properly applied.

OPENING CELEBRATION BY L. O. KOVEN & BROTHER.

L. O. Koven & Brother an Saturday last, July 9th, celebrated the opening of their new plate-shop. Cordial invitation had been extended throughout the the trade to attend this important event and about 350 responded and participated in the general enjoyment. As each guest arrived he was greeted by G. H. Koven and presented with a choice button-hole bouquet. Thus decorated, they were then passed on to the charge of L. O. Koven, who acted as guide through the various departments of the new plant. Perfect system and wise business-planning was evidenced everywhere and Phoebe Snow herself would have emerged spotless from the trip, a very unusual condition in a boiler establishment.

The latest building was specially decorated for the occasion and contained a stage upon which a choice vaudeville repertoire was rendered. (Our Eastern representative insists that we use the word "repertoire." You may be sure that when an Irishman uses a French word, it means something pretty good.)

L. O. Koven opened the proceedings with a suitable and cordial address of welcome to the guests and employees. During the evening, liquid and solid delicacies were supplied without stint and the far-off isle of Cuba paid tribute to the feast, the smoke-clouds of the night obscuring the cares of the past and the future most effectively.

G. H. Koven was called upon for a speech and the enthusiastic applause with which he was received testified to the esteem in which he is held by his employees. His timely welcoming remarks further cemented the bonds of alliance.

The new building is built on a site previously occupied by a huge rock 50 ft. high and its removal entailed considerable drilling and cartage. The enlargement of the plant is a proof of the increasing business of the concern and in the excavating, provision has been made for further extensions when necessary.

George Furman, the chief engineer of the firm, described the development of the industry and emphasised the co-operation that existed between employers and employees. He called for three cheers for the Koven brothers. They were given with vim and a twist of the tiger's tail.

Other speakers of the evening were the Rev. Brezenski, A. C. Jessup, John Leibald, Frank Chew and Amiel Stahe. Mr. Leibald has been 28 years with the Kovens. Good fellowship ruled all through the celebration, which will form the subject of many reminiscences in the future and the basis of lasting friendships.

The firm's new addition to its plant in Jersey City, adjoins the main buildings and extends northward 200 ft., on the Paterson Plank Road, and is 80 ft. in depth. This plant is now the largest of its kind in the United States.

The products of the firm are many and varied, the goods being used by every known industry. As stated by Mr. Koven, there is no industry known to him for which his firm does not do work of some kind. Much of the work done by the firm is used for cheapening the cost of manufacturing some product or other, or used for utilizing some by-product which has formerly been a waste.

The following are some of the lines for which the firm does considerable work, namely Plumbing, steam-heating, ship-building, meat-packing, ice-making, nickel-plating, metal-melting, mining and works of all kinds used in large mills.

To enumerate all of the lines would mean the enumeration of practically every industry.

Referring further to the building, it is constructed of concrete, brick and steel. It has two floors. One, the lower or basement, is for storage of steel and iron plates and unmanufactured goods. The upper floor is for manufacturing. The roof is trussed, the trusses being 80 ft. long, or the full width of the building. There are no posts on the main floor and the roof trusses are built heavy enough to carry the cranes and overhead transmission. The elimination of posts enables the use of the entire area and there is no dodging necessary, hence the handling of large work is easily accomplished.

One end of the building has a height of 55 ft. between the floor and the ceiling, thus the larger work can easily be handled in this section.

The building has large windows on both sides, the sashes being of steel and the glass in the sash being double thick, wired. Running almost the entire length of the building, on top of it, there is a ventilator, on both sides of which there is a continuous sash 6 ft. high. The sashes are on a swivel and are operated with chains from the floor below.

The larger tools used in this building will have individual electric motors. Electric sockets, also pneumatic connections, will be placed in convenient places so that power may be accessible in every part of the building, by electric plug or pneumatic house-connection. The lighting is of the most improved electric type obtainable.

The wash-room for use of the men has accommodations for 60 at a time, with the necessary toilets, etc. Sanitary steel lockers are provided for all of the men. The floor of the wash-room is of asphalt and the plumbing connections are of brass so as to prevent rust and insure perfect cleanliness.

The office of the foreman and the tool-room are in the basement. Both are provided with inside and outside telephone-connections.

The machinery to be installed will be of the most modern and of the very best. The matter of special machinery to be used has received the thoughtful attention of the firm for many months and the firm's representatives have visited many plants, making investigations. While work is going on in the equiping of this plant, ground will be broken for a power-plant.

The New York office of L. C. Koven & Brother is at 50 Cliff St. This office is connected by private telephone with all departments of the Jersey City factory.

NO MORE COMMON DRINKING-CUPS.

An item of considerable interest to our trade is a bill introduced in the U. S. House of Representatives by Mr. Coudrey, in which he proposes to vest the District of Columbia Commissioners with the power to prohibit the future installation of the common drinking-cup and to authorize them to install at certain public places drinking fountains of the bubbling type. It is expected that Mr. Coudrey's bill will receive the hearty approval of not only the plumbing trade and sanitarians, but the general public at large.

Efforts are being made to have a public-comfort station erected at Campau Square, Grand Rapids, Mich. The city council has appropriated $7,500 for this purpose. In case this amount should not be sufficient, business men in the city have expressed themselves as willing to contribute any additional amount of money necessary for the project.

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NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

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SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. Photographs and drawings with descriptions of special interest to plumbers and steam-fitters are welcomed. "Domestic Engineering" pays at space rates for all articles, notes, criticisms and news data so contributed.

WILL MAKE PUMPS AND CASTINGS.

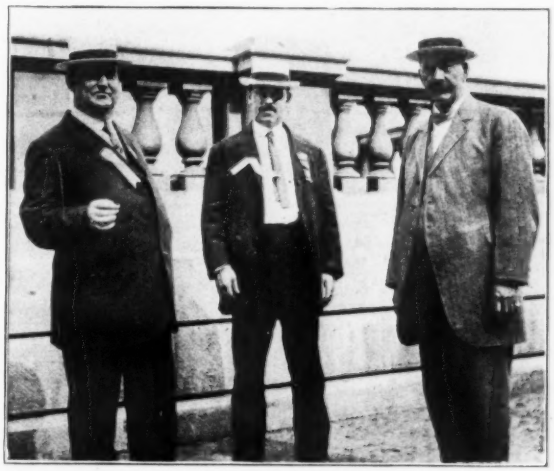
The Harrison Pump & Foundry Co., Harrisonville, Mo., has been incorporated with a capital of $5,000 to manufacture pumps and castings. The incorporators are N. P. Withington, H. H. Wright and J. H. Polhemus.

SLOAN VALVE CO. OPENS BRANCH OFFICES.

The Sloan Valve Co., 617 West Jackson Blvd., Chicago, announces that it has opened two branch offices, one at 40 Dearborn St., Chicago, with R. D. Bliss in charge, and one at 76 West 36th St., New York City, in charge of Thos. H. Hutchinson.

MEET SUCCESS WITH NEW SPECIALTY.

The Capitol Brass Works, manufacturers of heating and plumbing goods at Detroit, Mich., is introducing quite extensively this season the electro-magnetic separators of its manufacture, which have found a very practical application in machine shops, brass foundries, etc., for recovering valued metals from the floor refuse, etc.



At the Master Plumbers' Chicago Convention. From left to right are: P. J. Madden, of James B. Clow & Sons, Chicago; John Monahan, Chicago; M. E. Herbert, of the Herbert Boiler Co., Chicago.

NEW BRASS FOUNDRY.

The Lundhaven Brass Foundry Co. is erecting a new plant at 41-45 Letchworth street, Buffalo. The foundry is a one-story brick building 50 by 20 ft., and it will contain 14 furnaces. George W. Morris is president of the company and Frank L. Lund, vice president.

PURCHASES ADJOINING PROPERTY.

Canfield Supply Co., Kingston, N. Y., jobbers of plumbing and heating supplies, has recently purchased another large building adjoining its present office and show rooms. The new building will be converted into an office, display rooms, storage, etc., and will be used in connection with its growing business.

NOW IN THE WEST STREET BUILDING.

The Alberger Pump Co. and the Alberger Condenser Co., announce their removal to the West Street Building, 140 Cedar St., New York City.

LEASING LARGE SPACE FOR MANUFACTURE OF HEATING GOODS.

The Moore Heating & Mfg. Company, Akron, Ohio, has leased the space formerly occupied by the Hedgeland Mfg. Company in the Power Block on South Market street, Canton, Ohio, and expects to have it fitted up in about 30 days for the manufacture of heating goods. The company will have 30,000 sq. ft. of floor space.

WILL MAKE ABRASIVE WHEELS AND MATERIALS.

The National Corundum Wheel Co., Buffalo, N. Y., has been incorporated with a capital of $100,000 to manufacture abrasive wheels and materials. The incorporators are: Wm. H. Farnsworth, 937 Main St.; Conrad W. Zimmer, 18 Live Stock Exchange; Lester H. Knapp, 302 Main St., all of Buffalo.

Another Echo from the Chicago Convention of the National Association. Reading from left to right they are: Chas. T. Cowan, of the Cowan Mfg. Co., Pittsburgh; E. W. Barnes and E. Ruesser, both of the Galard Co., Newark, N. J.; Mrs. and Mr. John D. Blake and Miss Blake, all of Rock Island, Ill.; Mark Leavenworth and W. J. Langenheim, both with the Ruud Mfg. Co., Pittsburgh, Pa.

Seen at the Recent Chicago Convention of the National Association of Master Plumbers. From left to right they are: G. W. Churchill, Sales Manager; Wm. T. Morgan, Vice-President and General Manager, both of the Raymond Lead Co., Chicago; Geo. McCullom, Muskegon, Mich.; Col. Robert Sproul, Grand Rapids, Mich.; James Kelly, of Thos. Kelly & Bros., Chicago; Frank T. Merwin, of the Cooper Sanitary Mfg. Co., Philadelphia; John Kelly, of Thos. Kelly & Bros., Chicago.

WILL ERECT A LARGE PLANT.

The Birmingham Valve & Fittings Co., Birmingham, Ala., will erect a half a million dollar plant at East Birmingham—work to begin within the next week or so. The officers are: W. H. Stockham, president; C. C. McClarty, vice president, and James Weisel, treasurer. The company was formed by merging the Howe Mfg. Co., Louisville, and the Stockham Pipe & Fittings Co., Birmingham. Jeptha Howe, of Cincinnati, is a director, as are several prominent Birmingham citizens.

IN THE INTEREST OF "NACO" RANGE-BOILERS.

Frank S. Hanley, 261 Broadway, New York City, secretary of the National Committee of the Confederated Supply Association, has just issued some attractive motto-cards which will no doubt prove ornamental and useful decorations for plumbing establishments. Two of these cards have just reached us and they bear the following legends: "If it's a 'Naco' galvanized range-boiler its actual capacity is assured."—"The best is cheapest. There is no come-back, if you furnish 'Naco' galvanized range-

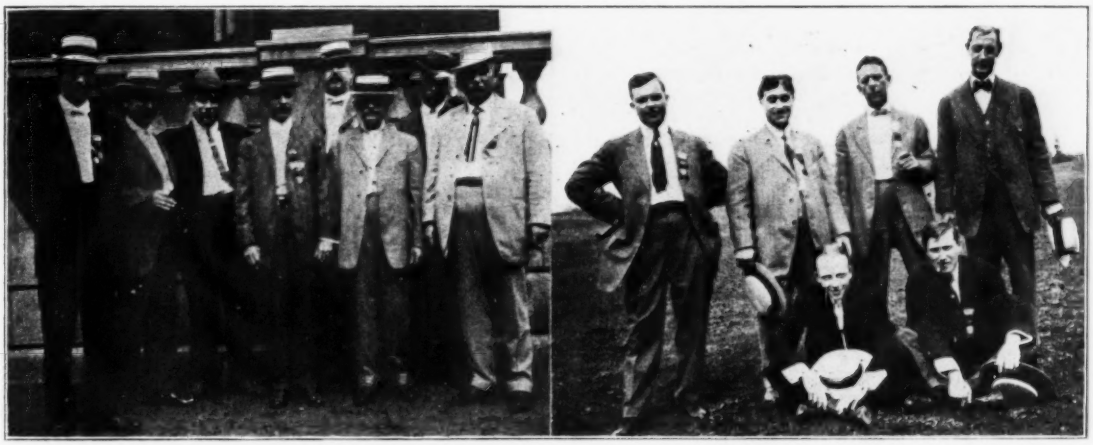
boilers. A-1 material, first-class construction, and a guarantee that the boiler is exactly as represented. 'Naco'."

CRANE CO. ERECTS FIREPROOF BUILDINGS.

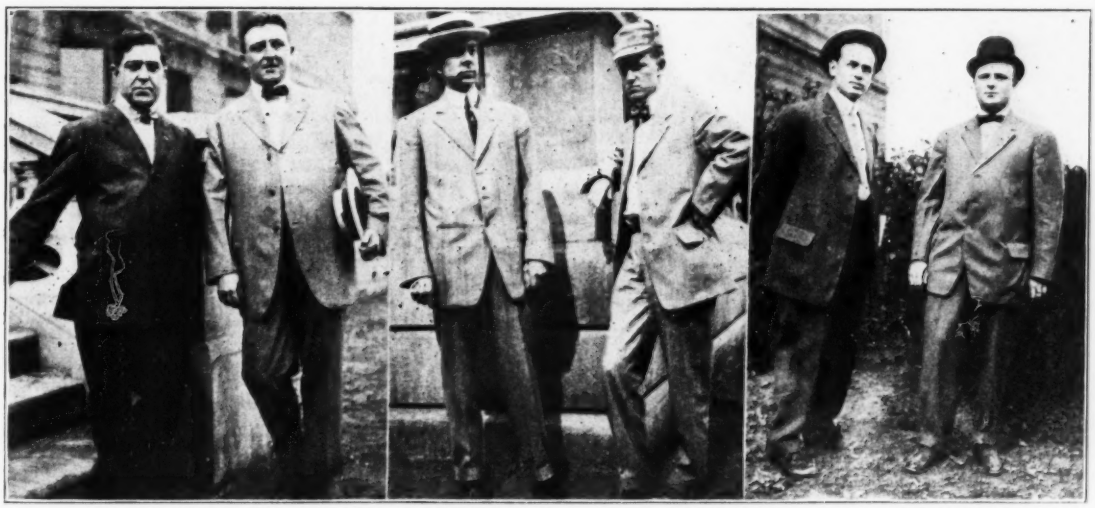
Crane Co., Chicago, is at present erecting the first section of its brass department, 110 x 120 ft., four stories, fireproof construction, at the southwest corner of South Canal and Twelfth place. The erection of this new building is due to the demand for additional space caused by the company's natural growth and to the policy now adopted of getting its business into fireproof buildings. For a number of other reasons, including the heavy advance in the price of lumber, etc., Crane Co. has been installing its branches in a fireproof type of building quite extensively for several years, and has also started to do the same thing with its factories in Chicago. While the building first mentioned is the initial unit in its brass department, it has just completed a building of this kind for its malleable-iron fitting department, which it expects to move into within the next two months.

BUYS MANUFACTURING AND SELLING RIGHTS.

The American Valve Co., Indianapolis, Ind., has acquired the manufacturing and selling rights of the Monarch valve, formerly manufactured by the Monarch Closet Valve Co., in that city, and it is at present equipping a plant at Ft. Wayne and St. Joseph Sts., in Indianapolis, where these valves will be manufactured in large quantities.



From the Chicago Convention of the National Association. Reading from left to right they are: F. W. Barclay; James Kelly, of Thos. Kelly & Bros., Chicago; Frank T. Merwin, Cooper Sanitary Mfg. Co., Philadelphia; H. R. Riley; Mr. Kelly, of the Trenton Potteries Co., Trenton, N. J.; John Kelly, of the Thos. Kelly & Bros., Chicago; S. E. Nolan and E. J. Nolan, both of Cincinnati; C. S. Carpenter, of the Spencer Heater Co., Scranton, Pa.; A. N. Wagner, of Nelson & Wagner Oak Park, Ill.; J. J. Condon, Chicago; Wm. Kelly, Birmingham, Ala. The Two Gentlemen Sitting on the Grass are: E. De Forest Winslow, of the E. C. B. Judd, Inc., Muskegon, Mich., and S. A. Witt, of the Chicago Branch of the International Heater Co., Utica, N. Y.



From the Recent Chicago Convention of the National Association of Master Plumbers. Reading from left to right they are: G. E. Murch, of the Richardson & Boynton Co., Chicago; Cecil Heap, of Wm. Heap & Son, Grand Haven, Mich.; M. C. Honeywell and J. C. Teague, president and secretary, respectively, of the Honeywell Heating Specialty Co., Wabash, Ind.; O. T. Carson, of the Pittsburgh Gage & Supply Co., Pittsburgh; A. T. Philippi, of Bishop & Babcock Co.'s Chicago office.

WHO LOST HIS CUFFS AND GOLD CUFF-BUTTONS AT THE CHICAGO CONVENTION?

The H. Mueller Mfg. Co., Decatur, Ill., writes us the following letter, which is self-explanatory: "In packing up the Mueller exhibit at the recent Chicago convention of the National Association of Master Plumbers, we came across a pair of cuffs and cuff-buttons which had been left by some visitor at our booth. At first we were under the impression that they belonged to one of our representatives, as the initials thereon corresponded to the name of one of our men. This, however, proves to

be an error, and we are left with a new pair of cuffs and a pair of solid gold cuff-buttons on hand. The cuffs have never been laundered and have a band of narrow stripes at the front and back edges. The buttons are oval shaped, containing an initial letter, and we would thank you to call the trade's attention to these articles in the hope that we may locate the owner, who will be in a position to tell us the initial letter engraved on the cuff-buttons. We shall be glad to hear from the owner as soon as possible, and request that he writes us at our general offices in Decatur, Ill. The articles will be returned promptly upon receipt of his letter."

H. H. BLAKE JOINS GALARD FORCES.

H. H. Blake, formerly with the Hunting Co., Rochester, N. Y., has enlisted as Philadelphia representative of the Galard Co., Newark, N. J., manufacturers of "Omala" toilet seats, flush tanks and other sanitary bath room furnishings. He is busily engaged showing the remarkable acid and alkali-proof qualities of "Omala," the "white that stays white," and he is meeting with generous response from the local plumbing trade.

H. H. Blake.

WILL MOVE ITS HEADQUARTERS.

The Crandon Manufacturing Co., Bellows Falls, Vt., has leased a vacant store on Bridge street, in that city, where its headquarters will be located. At present the company is devoting its entire capacity to the manufacture of automatic heat regulators.

PERSONAL MENTION.

H. S. White has been appointed sales-manager for the Detroit Seamless Steel Tubes Co., Detroit, Mich., and he has assumed his new duties.

John Sullwold, president and secretary of the Western Supply Co., St. Paul, Minn., was in Chicago last week. Mr. Sullwold has recently become a motor-boat enthusiast and drives a boat which under his conservative management will develop a speed as low as 30 miles per hour.

Albert V. Conradt, secretary and treasurer of the Great Western Pottery Co., Kokomo, Ind.; Herbert B. Hallett, of the John Wood Mfg. Co., Conshohocken, Pa.; and Francis J. Baker, president of the Geo. H. Fay Co., San Francisco, were registered at the Stratford hotel, Chicago, last week.

Efforts are being made to have the plumbing ordinance for Rock Island, Ill., amended in order to make it up-to-date.

Efforts are being made to compel the City Railway Company of Des Moines, Ia., to construct a public-comfort station in connection with street-car waiting room.

OBITUARY.

Thomas F. Healy, a well-known master plumber at 1150 Florida St., San Francisco, Cal., died recently at his home in that city. He was a member of the San Francisco Master Plumbers' Association.

Ferdinand J. Kaether, a retired master plumber in Newark, N. J., died at the city hospital, in that city, on Tuesday, June 28, in his 79th year. Mr. Kaether came to Newary, N. J., from Germany in 1857.

T. F. Ferguson, of the plumbing firm of T. F. Ferguson & Son, Brooklyn, N. Y., died at his home in that city on Tuesday, July 5, in his fifty-fifth year. He is survived by his widow, three sons and one daughter.

Joseph Haire, a prominent master plumber at Newport, R. I., and a former member of the city government of that city, died of apoplexy on the evening of July 5. He was 53 years of age and was considered one of the most expert plumbers in this part of the country. He is survived by a wife and four daughters.

Martin Anderson, a well-known master plumber at Bridgeton, N. J., died at his home in that city on Tuesday evening, July 5th, in his 72nd year. Mr. Anderson came to Bridgeton from New York State in the Civil war times and founded the plumbing business, which he continued to the time of his death. For many years he had Jesse Claypoole as his partner, the firm name being Claypool & Anderson. This firm conducted a successful plumbing and heating business for many years. Later Mr. Anderson became the sole proprietor of the business and was assisted by his sons. He was closely identified with the city's growth and prosperity, and in the prime of his life was influential as a business man. He was a man of a generous temperament and leaves a host of friends. He belonged to several fraternal societies and had served for 25 years as treasurer of the Masonic Evening Star Lodge No. 97. His wife, two sons and a stepdaughter survive him.

CONTRACTS AWARDED.

Sullivan Bros., Quincy, Ill., have secured the contract for the installation of the plumbing system in the new Lincoln school at a consideration of $4,017.

Thomas P. Moore, 226 W. Douglass St., Reading, Pa., has secured the contract for the plumbing in the new parish house of St. Mary's Catholic Church.

Steele & Torrance, Batavia, N. Y., will install the heating system and Russell & Palmer the plumbing system in the new Odd Fellows' temple in that city.

Fred C. Park, Orono, Me., has been awarded the contract for the installation of the plumbing system in the new Webster schoolhouse to commence work immediately.

F. Connolly, 135 Concord St., St. Paul, Minn., has secured the contract for the plumbing of the new West Side Club building, while J. D. Hyland, 106 E. Fourth St., secured the contract for the heating.

A. C. Schirmer Co., Hibbing, Minn., has been awarded the contract for the plumbing of the new St. Louis county courthouse at Virginia, Minn. The contract amounts to $3,000.

The Pribble Plumbing Co., 627 Quincy St., Topeka, Kans., has secured the contract for the plumbing of the Ward high school building at Horton, Kans.; also the contract for the plumbing of the Horton residence at 12th and Tyler Sts., Topeka.

L. Von der Kuhlen, Fourth St. and Fremont Ave., Los Angeles, Cal., has awarded the contract for plumbing his new apartment house to N. F. Bower, 221 E. 24th St., in that city.

George A. Wara, San Francisco, has been awarded the contract for the plumbing work in the four-story anartment building being erected on Pine St., near Taylor, by R. C. Williams. The consideration is $2,275.

A. S. Chellberg, Wayne, Neb., has been awarded the contract for the plumbing and heating the new residence of William Beckenhauer.

THE METAL MARKET

CONTRACTION IN PIG IRON.

The manufacture of pig iron continues to fall off. During June the average daily production was less than 76,000 tons, the smallest rate in any month since last September. The decline has been steady and now is fully 15 per cent less than the high ratio established in February of this year. This is not all; the reports from pig iron producing centers are to the effect that business is dull and prices are weakening further. The indications are that not only will there be the usual mid-summer dullness, but additional furnaces will go out of blast until consumption balances production. Sales during the week have been few, and although there have been numerous inquiries for lots of from 1,000 to 5,000 tons for New England delivery, there has been no animation in the market. In Birmingham it is becoming easier to secure iron for delivery throughout the last half of the year at $11.50, and only a few makers are asking $12. It is doubtful if any $12 iron has been sold during the week. It is evident that more foundries were closed during the heated term than usual, and while the outlook for foundry labor is more promising, still there is just enough uneasiness among the laborers and resentment among the employes that an enforced spell of idleness would not be disliked by many of the latter. Prices are as follows:

No. 2 Southern foundry, Birmingham	$11.50 to $12.00
No. 1 Virginia foundry, New York	16.75 to 17.00
No. 2X Northern foundry, New York	16.00 to 16.75
No. 2 Plain Northern foundry, New York	16.00 to 16.25
No. 2 Northern foundry, Chicago	16.75 to 17.25

OLD IRON.

Although a slight improvement might have been noticed by a careful observer last week, this has since disappeared and now the market has fallen back to its old quiet state with prices working lower as follows:

No. 1 yard wrought long	$11.50 to $12.00
No. 1 yard wrought short	11.00 to 11.50
Machinery cast	12.00 to 12.50
Wrought pipes and tubes	11.75 to 12.25
Wrought turnings	6.75 to 7.25
Cast borings	6.50 to 7.00
Stove plate	9.00 to 9.50

PIG TIN.

While there is a momentary advance on the announcement that shipments to the interior during June amounted to 5,000 tons, this was quickly lost and tin prices have declined to 32.80 cents. There has been no business of importance during the week, the chief transactions having taken place among dealers being of the nature of speculative transactions, or at best to even up old contracts. It has been previously pointed out that the heavy consuming season in tin is over, and from now on there will be a chance to replenish supplies.

LEAD.

The outside interests, who have been selling lead freely for a month at 4.37½ cents, have evidently disposed of their supplies and are now asking 4.40 cents. Business is improved, but there is no shortage in the metal, nor is there any immediate prospect of prices going higher. This is particularly true in view of the seasonable demand for white lead having fallen off.

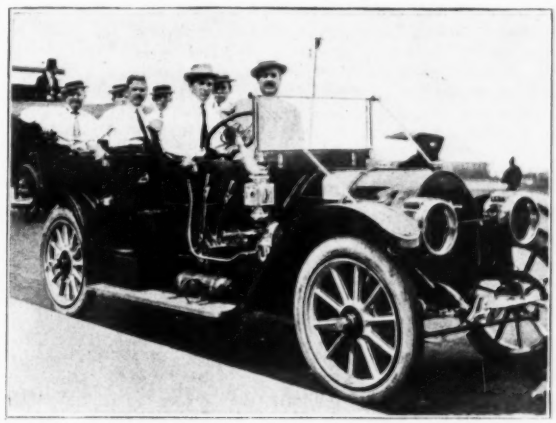
GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury Department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m., Aug. 8, 1910, for the construction, including plumbing, heating, gas-fitting and electric wiring, of the U. S. postoffice at Amsterdam, N. Y.

Until 3 p. m., Aug. 9, 1910, for the construction, including plumbing, heating, gas-fitting and electric wiring, of the U. S. postoffice at Woburn, Mass.

Until 3 p. m., Aug. 10, 1910, for the construction, including plumbing, heating, gas-fitting and electric wiring, of the U. S. postoffice at Decorah, Iowa.



From the Recent Chicago Convention of the National Association of Master Plumbers. Fred Mueller, of the H. Mueller Mfg. Co., Decatur, Ill., is seated with Ray Renish, the Chauffeur. In the Middle Seat from left to right are: A. A. Ainsworth, of Apperson Motor Car Co., Chicago; F. P. Keeney, of "Domestic Engineering," Chicago. In the Rear Seat from left to right are: Harry Snow, Robert Schmalmack, Assistant Sales Manager, H. F. Weaver, Manager, all with the Peerless Selling Co., Evansville, Ind.—Photographed in Mr. Ainsworth's Machine.

Until 3 p. m., Aug. 19, 1910, for the construction, including plumbing, heating, gas-fitting and electric wiring of the U. S. postoffice at Palestine, Tex.

All proposals should be in accord with drawings and specifications, copies of which can be obtained from the custodians of the above postoffices or from the office of the Supervising Architect at Washington, D. C.

Geo. B. Grey, 115 South 16th St., Philadelphia, has secured the following contracts:—plumbing and gas-fitting in factory at 1304-06 Race St.; drainage in tool house at 10th and Norris Sts.; plumbing and gas-fitting to store and office building 122 North 13th St.; plumbing and gas-fitting in store at 1322 Chestnut St.; plumbing and gas-fitting in apartment house at 1809 Chestnut St.; plumbing, drainage and gas-fitting in farm house at King of Prussia, also a pneumatic water-supply system; plumbing and drainage in wall paper factory at Water St. and Snyder Ave.; plumbing and gas-fitting in additions to a residence at Overbrook.

The Fort Dodge Heating & Plumbing Co., Ft. Dodge, Ia., has been awarded the contract for the installation of the plumbing and heating systems in the Snell building.

NEW ENGLAND NOTES.

M. D. Holmes & Son have been awarded the contract for furnishing and installing a heating plant in the Webster school at Worcester, Mass., the contract price being $2,125.

The Austin Stove Store, organized at Eden, Me., has filed articles of incorporation with the secretary of state of Maine. The business of the concern as stated on the certificate is "conducting a general stove, plumbing and sheet metal business. William S. Austin, Bar Harbor, is president and treasurer of the company.

Jesse M. White, who has been engaged in the plumbing business in Bristol, Conn., for the past nine years, has incorporated his business and in the future the name will be The J. M. White Company. Mr. White is president of the new concern, David A. Kelley is vice-president and Harry G. White secretary and treasurer. The headquarters of the concern will continue at the old stand, 129 Main St.

The contract for furnishing and installing a new heating plant in the Woodland street school building in Worcester, Mass., has been awarded to O. S. Kendall & Son, of that city, for $3,146.

Noble, Milne & Co., Pittsfield, Mass., have been awarded the plumbing contract for the addition to the New American hotel in that ciy.

The steamfitting contract in connection with the addition which is being made to the American House at Pittsfield, Mass., has been placed with Robbins & Gamewell in that city.

Bids for plumbing in certain of the school buildings in Providence, R. I., have been received by the board of contract and supply of that city as follows: From the H. H. Dauphine Co.: Thayer-St. school, $1,685, alternate, $1,773; Roger Williams-Ave. school, $1,083; Friendship-St. school, $979; Bridgeham-St. school, $2,075, alternate, $2,170; Arnold-St. school, $1,897, alternate, $1,989. From D. F. Holmes & Co.; Bridgham, $1,538, alternate $1,653; Federal, $1,110, alternate, $1,160; Arnold, $1,332, alternate, $1,442; Roger Williams, $910, alternate, $960; Friendship, $850, alternate, $900; Thayer, $1,668, alternate $1,798. From McCauley Bros.: Roger Williams, $995. From P. & J. Tierney Co.: Arnold, $1,637, alternate, $1,947; Thayer, $1,881, alternate, $1,429; Bridgham, $1,845, alternate, $2,328. From M. F. Murphy: Roger Williams, $838; Bridgham, $1,592; Friendship, $667; Thayer, $1,637; Arnold, $1,429; Federal, $1,030. From John F. Keenan: Thayer, $1,500, alternates, $1,653 and $1,549; Federal $1,113, alternates, $1,216 and $1,176; Arnold, $1,180.68, alternates, $1,273 and $1,185; Bridgham, $1,543, alternates, $1,669 and $1,577; Friendship, $753, alternates, $812 and $772; Roger Williams, $830, alternates, $864 and $892. From John J. Shanley: Arnold, $1,867; Roger Williams, $951; Bridgham, $1,589; Friendship, $708; Federal, $1,030; Thayer, $1,606. From Donnelly Bros: Federal, $824. The contracts have not yet been awarded by the committee.

B. A. Adams is installing a hot-water heating system in the residence of D. E. Martin on Church St., Rutland, Vt.

The sub-contract for plumbing, heating and ventilating in connection with the changes which are being made in the school house at Montpelier, Vt., has been placed with Peck Bros. The general contract is held by the Alexander Duncan Co., Boston.

Burritt & Montgomery, Norwalk, Conn., have the contract for the plumbing in the handsome new bungalow which is being erected at Hickory Bluff for Wesley Wood, of Darien.

Hezelton & McNair, plumbing contractors at Westbrook, Me., are putting in a complete plumbing system in the house of George Saywood at Windham, Me.

The contract for installing the new plumbing in the Lakeview Home at Bridgeport, Conn., has been awarded to Joseph Mullins & Co.

WANT MORE WAGES.

Journeyman plumbers at North Yakima, Wash., have asked the master plumbers of that city for an increase in wages from $5.00 to $6.00 a day.

Master plumbers of Independence, Kans., have agreed to pay their journeyman $5.00 a day.

PHILADELPHIA AND VICINITY.

G. S. Warfield, plumber, in his neatly furnished show rooms at S. 20th and Panama streets, exhibits two completely furnished model bath-rooms, as well as eight bath-tub samples, etc. In his large street-show-windows he displays gas fixtures and supplies and these plainly advertise the fact that he is selling and installing fixtures as well as transacting a general plumbing business. Mr. Warfield is busy with contracts for suburban-dwelling plumbing and enjoys a reputation for doing high-grade work.

Morris L. Horner was a recent visitor, representing the Speakman Supply and Pipe Co., of Wilmington, Del., whose sales staff he lately joined. He successfully exploited shower and brass goods.

"Jim" P. Walker, master plumber, who recently opened a new shop at 2149 East York street, is very busy and that's a sign that his venture is proving successful. He has several small plumbing contracts and is said to be gunning for a large one or two.

An unusually complicated will-case was before Register Martin the past week. The case was that of Thomas Harkness, 5745 Spruce St., the pioneer master plumber who died May 17th last year, leaving about $25,000. He left five wills and named several executors and all this, with other complications, the Register is endeavoring to untangle.

At the last meeting of the city council a petition was received from employes in the Bureau of City Property requesting an increase in wages of plumbers' helpers from $3 to $3.50 per day. The petition was referred to the finance committee.

Emil Klemm & Co., 225 Law Bldg., Baltimore, want prices on hot-water heating plants.

Winfield S. Reed, chief plumbing inspector of the Bureau of Health, is having improvements, including new plumbing, made to his dwelling on N. 11th street.

The Newell Brass Manufacturing Co., Broad and Buttonwood streets, which mainly does plumbing-supply manufacturing, is quite busy and has employed a few additional shop hands.

W. F. Seifert has sold his plumbing business at 3824 Germantown avenue, to Charles E. Hanson, a competent and experienced master plumber, He has taken charge.

John H. Jackson, 3135 N. 15th street, is very busy on new and repair heater and range work and has employed additional assistants.

A. H. Moore, master plumber, Ridgewood, N. J., was a recent visitor. He was accompanied by one of his "helpers," Ed. Schell. The latter is a great chicken-fancier and he related that the eggs his hens lay are in big demand. "I put a steam-heating plant in my hen-house," said Ed., "and I furnish fresh eggs, or cooked eggs,—steam cooked, you know. They're a great favorite at Ridgefield boarding houses, y'know—saves the cook's time. I put three Easter eggs in a setting and the hen hatched out peacocks. Under the higher law the rooster killed the innocent mother." Next!

MILWAUKEE AND WISCONSIN NOTES.

The Downey & Kruse Co., Milwaukee, has secured the contract for furnishing and installing the ventilating and heating systems in the new $60,000 city hall to be erected at Kenosha, Wis. The contract price for the work is $4,173. The building is to be ready for occupancy within eight months' time.

The Interstate Light & Power Co., of Platteville, Wis., has given notice to its patrons that it will discontinue the service of steam heat. As a result, it will mean that twenty-five business places in that city will have to make other arrangements for obtaining heat during the winter. It has been suggested that the property owners confer with the Interstate company for the purpose of renting or leasing its plant. But if this can not be done it will be necessary for each building to be equipped with an individual plant.

August Rheins, Milwaukee, has been awarded the plumbing contract for the new $60,000 factory building to be erected at Milwaukee by the Waltham Piano Co.

PACIFIC COAST LETTER

During the past ten days trouble in building circles at Stockton, Cal., has broken out and some plumbers there have quit work. The trouble started by the sheet-metal workers declaring one of the local builders unfair and refusing to work on jobs handled by him, and it has spread to other branches of the trade with the result that a test of strength is now on between the unions and the employers. In Los Angeles a strike is on among the metal workers and this is seriously interfering with building operations. A desperate effort is being made to unionize the southern city and financial assistance is being poured into that city by organizations all along the coast. It is unfortunate that trouble should be brought about at this particular time, as Los Angeles is experiencing the greatest building boom in her history. The labor troubles at Salt Lake City have not been patched up, and while work is going forward there, there is no doubt but that there would be a great deal more done if conditions were settled. In San Francisco there is no labor trouble in any line being experienced, and building operations are running along smoothly, there being a normal amount of work done. It would be gratifying for all concerned if similar conditions were in force in the neighboring cities of the state, but the fact that they are not is causing no uneasiness and no trouble is looked for here.

The initial steps for providing bathing facilities at the Children's playgrounds in San Francisco that have been established in various parts of the city have been taken and contracts are now being let for the construction of a swimming tank at the North Beach playgrounds. This will call for considerable plumbing work, as showers will also be installed.

The relative merits of steam heating and hot-air heating plants for public-school buildings about which so much controversy centered last winter are still being made the topic of discussion in San Francisco and recently the Board of Education made an appointment with representatives of the Plumbers, Gas and Steam Fitters union and others interested in the matter in order to get ideas on the subject. Those present were Edward McKeever and R. M. Wilson, representing the Journeyman Plumbers' Union; A. J. Gallagher, representing the San Francisco Labor Council; John Walsh, of the Moulders' Union; Walter S. Levin, of the Merchants' Association; H. W. Kerrigan, of the California Metal Trades Association; John I. Nolan, of the Home Industry, of Iron Trades Council; T. B. Hunter, R. A. Hudson, Thomas Morrin and W. E. Leland, heating and ventilating engineers. Mr. Russell, of the city architect's office, was also present and recommended that a thorough test of the two systems be made, at which a representative should be present from the Board of Public Works and the Board of Education. The matter has been taken under advisement by the Board of Education. The superintendent of public schools is in favor of hot-air heating systems.

The Turner Co., San Francisco, has been awarded the contract for the plumbing to be done in the building to be erected by the St. Francis Realty Co., on Geary street, near Mason. This is one of the largest plumbing contracts for the week, and is valued at $6,900.

A. Davis, San Francisco, has secured a contract valued at $630 for the plumbing work to be done in a building being erected by O. Casperson on Twenty-ninth street, near Sanchez.

Mangrum & Otter, San Francisco, are rushing work on the ventilating contract in the new Y. M. C. A. building on Golden Gate avenue, near Leavenworth street, and have this about completed.

The contract for the plumbing work in the building being erected on Clayton street, near Fell, by W. E. Klein, has been secured by D. Gibbs on his bid of $1,384.

The Pacific Gas & Electric Co., San Francisco, is preparing to expend several hundred thousand dollars in remodeling the gas plant at Vallejo, Cal. This work is to include the rebuilding of the distributing system. All of the service pipes are to be torn out and the ¾-in. pipes that have been used for decades will give way to one and two-inch pipes. Many miles of this will be required.

Francis J. Baker, president of the George H. Tay Co., San Francisco, is now in the East and his return is not expected for some time, as he will visit the large business centers before starting home.

The plumbing work in the six-story hotel building being erected at 58 Olive St., Los Angeles, by R. D. Wade, is to be installed by J. Hokum. This contract is valued at $11,300.

Several objections to the new plumbing ordinance at Berkeley, Cal., have been filed and a special meeting of the city council was held recently for the purpose of securing a general expression on the subject. No immediate action on any of the points under consideration was taken but it is probable that some changes will be made in the near future.

A new building code will be placed into effect at Portland, Ore., commencing with the first of the year, 1911, and several changes will be made in the present system of plumbing inspection.

H. T. Sherriff, who represents Nye, the Die Man, on the Coast, is calling upon the trade in the southern part of the state at the present time.

D. Gibbs, San Francisco, has secured the contract for installing the plumbing system in the apartment building being erected by W. E. Klein on Clayton St., near Fell, the price agreed upon being $1,384.

The John G. Sutton Co. is preparing to install a hot-water heating system in a building being erected by Bertha Lent on Pacific Ave.

An automatic sprinkler system is to be installed by O. Eastwood, San Francisco, in the building under course of erection by the William Ede Company on Market St., near Seventh.

The plumbing work in the new building being erected by the Crane Investment Company on Sacramento St., near Van Ness Ave., is to be done by Edmund Grundy, San Francisco, for $3,700.

Condon & Band, San Francisco, have secured a plumbing contract valued at about $500 for the work in a two-story building being erected by Mrs. A. G. Flint on Nineteenth St., east of Sanchez.

Charles T. McCarthy has contracted to install the plumbing for Jean Jaussaud in a three-story apartment building being erected on Hyde St., south of Pine; the consideration is $893.

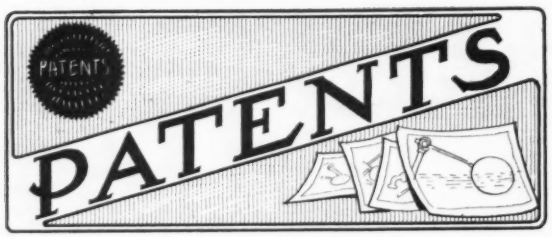
The Columbia Hardware & Plumbing Co. has started in business at Pasco, Wash., having taken over the business of G. S. Wilcox, who is now manager of the new concern.

A central heating plant is to be established at Aberdeen, Wash., by C. L. Pederson, who has secured a long term franchise.

Work on the Examiner building, at Third and Market streets, is now well under way, a part of the steel frame being in place. The plumbing contract has not been let yet, but this is expected soon. This is expected to be one of the largest of the year.

Many of the large plumbing supply houses in San Francisco as well as plumbing establishments have subscribed to the fund for the World's Fair to be held in this city in 1915 and this has now passed the $5,000,000 mark.

The Board of Public Works, at San Francisco, has received bids for the laying of the cast-iron pipe to be installed in Section 1 of the Auxiliary salt water fire protection system embracing the district between Powell and Market streets and the bay. The Keystone Construction Co. submitted the lowest bid, $129,000, and this will probably be accepted. The bid is about $6,000 lower than the estimates originally made by the engineer's office. This work is to be rushed to completion at the earliest possible date and practically all of the material is at hand now.



961,900. Combined Heating System for a Plurality of Boilers. John Schwab, Winnipeg, Manitoba, Canada.

961,901. Hydrant and Hose Cut-Off Valve. Frederic Scott Seagrave, Detroit, Mich.

961,906. Sprinkling Device. John Franklin Smith, Little Rock, Ark.

961,937. Electric Water-Heater. William F. Cutler, San Francisco, Cal., assignor to Cutler National Electric Heater Co., San Francisco, Cal., a corporation of California.

961,971. Gage-Cock. Frank Wallace Deidecker, Marietta, Ohio, assignor of one-eighth to Charles Mount, Carmen, Ohio.

961,981. Pipe or Rod Connector. Albert F. Miller, Kansas City, Kans.

962,031. Filter. George M. Kneuper, New York, N. Y.

962,075. Pipe-Union. Arthur W. Cash, Newark, N. J., and Claude Rorabeck, New York, N. Y.

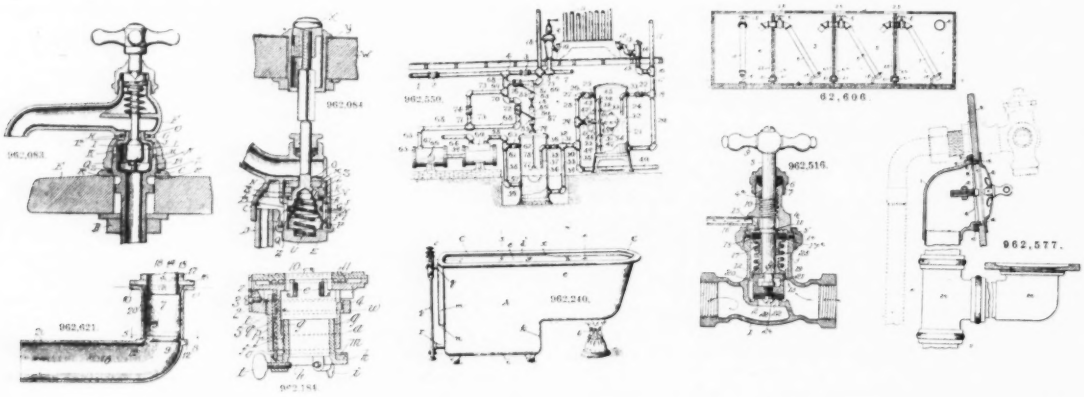
962,083. Basin-Cock. William Sydney Graham, Chicago, Ill., assignor to Federal-Huber Company, Chicago.

962,107. Pressure-Gage. Leslie J. Watson, Upton Works, Mich.

962,184. Die-Stock. Frederick E. Wells, Greenfield, Mass. In a die-stock, the combination with a body member having threads formed therein, a pipe-clamping member having threads for engaging the threaded portion of said body member, a grooved annular portion integral with the clamping member, a wedge member provided with tongues for engaging the grooved portion of the annular member, a ring member rotatively mounted on the body member and having a recess formed therein for receiving the inclined surface of the wedge member during the relative axial movement of the wedge and ring members, chasers provided with teeth, a scroll member engaging the grooves of the chasers, and connecting means between the ring and scroll member, whereby the chasers may be operated during the thread-cutting operations, as described.

962,189. Radiator. Emil Behringer and Herman Berringer, Brooklyn, N. Y.

962,240. Bath-Tub. Joseph H. Neal, Baltimore, Md. A cast-metal bath-tub whose bottom is divided into two distinct parts—the front-end part being in a lower horizontal plane than the rear-end part which latter being higher serves as a seat, in combination with a hollow top-roll that contains a water-conduit provided with an open slot along the inward side of the roll—said conduit having a raised edge, g, which confines the water to the conduit and extends from the front-end of the tub back to a point above the front of said seat, the conduit from said seat back to the rear-end of the tub having a low edge, h, which permits the water to flow from the conduit down the sides of the walls around and onto the seat.



Ill., a corporation of Illinois. In a basin cock, a service-pipe connecting member passing through and secured to the basin-slab and projecting above the same, the projecting end portion being annularly enlarged and externally threaded, a cock or body-portion having a removable member secure to, said removable member being equipped with an annular shoulder between its ends, the lower end portion of said removable member and the projecting end portion of the service-pipe connecting member having tapering walls so as to permit the one to take within the other to a predetermined point, and a cap-nut freely rotatable relatively to and engaging said removable member and the projecting end portion of said service-pipe connecting member whereby the end of one member is wedged within the end of the other to form a fluid tight joint and secure said cock onto the service-pipe connecting member.

962,084. Faucet. William Sidney Graham, Chicago, Ill. Assignor to Federal-Huber Co., Chicago, Ill., a corporation of Illinois. A faucet provided with a chamber communication with a source of supply under pressure, said chamber also having an outlet, a valve slidably mounted in said chamber and normally closing said outlet, means whereby the pressure of the supply may constantly be directed on the valve in the direction of its seat and utilized in returning the valve to its normal position, and means for establishing communication between the upper and lower sides of the valve whereby said pressure may be equalized on both sides of the valve when the latter is being forced from its normal position.

962,294. Water-Heater. John R. Armington, Roanoke, Va.

962,394. Apparatus for the Distribution of Liquid Soap in Lavatories. Rufus N. Sheldon, Norwalk, Ohio, assignor of one-half to Samuel W. Rohn, Norwalk, Ohio.

962,405. Apparatus for Raising Temperature of Water. James W. Parker and Frank L. Hurtt, Peoria, Ill.: said Hurtt assignor to said Parker.

962,516. Compression Stop and Waste. Philip Mueller, Decatur, Ill., assignor to The H. Mueller Manufacturing Co., Decatur, Ill., a corporation of Illinois. In a device of the character described, a body having inlet and outlet with a main valve seat between, a positively actuated main valve therefor, an exhaust, a waste valve connected with a support, and having two seating points for controlling the exhaust, one of them closing communication from it to the support and means of actuating this valve independent of the main valve and in opposite directions to open or close the exhaust.

962,550. Steam-Heating System. John Collis, Newark, N. J. A heating system comprising a radiator, a main pipe leading to and connected with said radiator, and a pump, said pump having a steam and a suction chamber, a return-riser leading from said radiator, a valve in said main pipe for admitting live steam to the radiator, said valve being normally closed, a pipe connected with and leading from said main pipe to the steam-chamber of the pump, an automatically controlled valve in said last-mentioned pipe, pipe-connections between the suction chamber of the pump and the return riser for producing a

vacuum in the radiator, and instrumentalities located between said pipe-connections and provided with means operated from the water of condensation for periodically opening and closing the valve in said main pipe, and automatically controlling the valve in the pipe leading from said main pipe to the steam-chamber of the pump.

962,577. Combined Waste and Overflow. Henry Mueller and Philip Mueller, Decatur, Ill., assignors to The H. Mueller Manufacturing Co., Decatur, Ill., a corporation of Illinois. In a combined waste and overflow, the combination of an elbow having an intake for connecting with the outflow aperture in the tub, a flange thereon to engage the outer side of said tub, a grate within the tub adapted to be connected to the elbow, a circular rib adjacent the flange on the inner edge of the elbow, a gasket adapted to frictionally engage said rib, and a number of straight integral lugs on the edge of said rib parallel to the axis of the same for quickly engaging said aperture when the parts are assembled.

962,606. Sewage-Disposal Plant. Martin J. Wiest, Govans, Md. A sewage disposal plant comprising a plurality of intercommunicating tanks, one of which has an inlet for the sewage, a pipe in each tank extending from near the bottom up into the next adjoining tank near the top thereof, valves in the partition walls of each tank, an asceptic bed having an outlet, and a number of apertured pipes arranged on top of said bed and having communication with one of said tanks.

962,621. Closet Connection. Frank W. Carlson, Chicago, Ill. A closet connection consisting of a horizontal member provided at one end with fastening lugs and a seat consisting of a flat portion, a flange extending upwardly from the inner edge thereof, and having its upper outer edge chamfered off to form with an upright member a recess for the reception of cement, said upright member engaging said seat and provided at its upper end with a horizontal flange, means engaging said flange and said lugs for securing the upright and horizontal members together, a plurality of bolts extending up through said flange, and lock nuts for normally maintaining said bolts in upright position to receive a bowl adapted to be secured thereto.

956,860. Mixing-Valve. James J. Lawler, Mount Vernon, N. Y.

956,863. Flushing Apparatus. Paul S. Millice, Hamilton, Ohio.

GAGES FOR INDICATING A VACUUM.

A mercury vacuum gage is fitted on the same principle as the barometer, in which the atmosphere sustains a column of mercury of about 30 in. in height, with a pressure of 15 lb. per square inch, and the condenser gage is for the purpose of showing how much the pressure in the condenser is less than that of the atmosphere, which is called vacuum. A small vertical iron tube, open at the top, and of sufficient length, is connected at its lower end to the condenser, with an iron cup surrounding the lower part to hold mercury, having a stop-cock between it and the condenser; a glass tube, closed at one end and open at the other, is introduced long enough to cover the iron tube, with the open end resting in the cup of mercury, so that while the stop-cock is closed, the mercury in the cup will remain stationary, as the pressure of the atmosphere will equally surround it, but immediately that the stop-cock is open, the vacuum that exists in the condenser will be communicated to the inside of the glass tube by means of the hole at the top of the iron tube, and the atmospheric pressure acting on the mercury in the cup will force it up between the glass and iron tubes, unless it meets and is balanced by the smaller pressure from the condenser (generally 2 or 3 lb.); therefore the mercury may be said to be acted on by two pressures, the pressure of the atmosphere forcing it up, and that from the condenser pressing it down. A scale of inches is fixed by the side of the glass tube, and every fall of 2 inches denotes an additional pound of pressure in the condenser; for example, if the barometer gage stands at 28 the pressure in the condenser is 1 lb.; 26 in., 2 lb., and so on.

The city clerk of Fond du Lac, Wis., has advertised for bids for a heating and plumbing system to be installed in the new high school building. The structure will cost about $150,000, according to an estimate.

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Advertisements under this heading 4 cents per word per issue, address included. Remittance to be made with order. To insure insertion copy should be received not later than Wednesday morning.

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WANTED—POSITION AS SALESMAN. Have had eight years' experience in plumbing and heating field. Address No. 351, "Domestic Engineering," Chicago.

WANTED—POSITION AS BUYER AND Sales Manager or Branch Manager in wholesale plumbing and heating supply line, by man now employed in similar position on the Pacific Coast. Prefer eastern city. Address No. 339, "Domestic Engineering," 325 Dearborn St., Chicago.

SITUATION WANTED—SALESMAN OF fifteen years' experience in plumbing and heating goods would like to connect with good jobbing house or manufacturer of plumbing goods; good reference. Address 355, "Domestic Engineering," Chicago.

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WANTED—SALESMEN TO SELL plumbers' specialties. The "B-B" Manufacturing Co., Cleveland, Ohio.

WANTED—CITY SALESMAN, EXPERIenced in plumbing and heating materials; permanent position for man who can get results. With Central Jobber. Address No. 366, "Domestic Engineering," Chicago.

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WANTED—COMMISSION MEN WHO could carry side line. Regular caller on Plumbing and Steam trade. Must carry sample. Good profit. Address No. 343, "Domestic Engineering," Chicago.

WANTED—MAN CALLING ON ARCHItects in New York City or any other large city in the United States to represent as a side line an article of plumbing that will not conflict with anything he is now handling. Address No. 365, "Domestic Engineering," Chicago.

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FOR SALE—INTEREST IN HARDware, plumbing and heating, in Central New York. This is an excellent opportunity. Address No. 357, "Domestic Engineering," Chicago.

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FOR SALE—HEATING BUSINESS which has been established for thirty years, owner retiring from business, and can offer attractive proposition; good opportunity; will give full details upon request to No. 360, "Domestic Engineering," Chicago.

FOR SALE — PLUMBING, TINNING, heating and stove business in a hustling little town in Connecticut; has city water and gas supply; established over 40 years; the only established business of its kind in town; a good chance for the right man; present owner wishes to retire. Address No. 367, "Domestic Engineering," Chicago.

A NEW CLOSET TANK THAT WILL not sweat; a good patent; will sell outright, or royalty. A good bargain—be quick. Address No. 361, "Domestic Engineering," Chicago.

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FOR SALE—PATTERNS, TOOLS, MAchines and stock of goods for best money maker ever produced. Sells itself. Big mail order trade. Write us for particulars. Address No. 358, "Domestic Engineering," Chicago.

IF YOU ARE DESIROUS TO BECOME interested in a good plumbing specialty we invite you to investigate. Excellent opportunity in established business. Address No. 363, "Domestic Engineering," Chicago, Ill.

FOR SALE—OLD RELIABLE ESTABlished plumbing and heating business in eastern New York, average increase in population in last ten years 5,000 per year; neat, attractive, no shop worn goods; will inventory about $2,000; owner desires to engage in manufacturing specialties: license can be retained until 1911. Address No. 354, "Domestic Engineering," Chicago.

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Parties having saleable specialties which they desire to have manufactured or marketed are invited to submit particulars. Address No. 333, "Domestic Engineering," Chicago.

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WANTED—A SELLING AGENCY OR position as sales agent by a master plumber of 27 years' experience in the plumbing business in that territory, comprising Colorado, Wyoming, Utah, New Mexico and Arizona. Address No. 342, "Domestic Engineering," Chicago.

A gentleman who has been connected with the plumbing and heating trade in San Francisco and on the Pacific Coast for many years, would like to handle a few select accounts as agent on the Pacific Coast with headquarters in San Francisco. A-1 bonds and references. Address No. 340, "Domestic Engineering," Chicago.

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A CHICAGO PLUMBER, STEAM AND hot water fitter; 16 years' experience in plumbing line, would like to locate in some good small city and buy a part or half interest in the business. Address No. 364, "Domestic Engineering," Chicago.

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SANITATION IN THE MODERN HOME. An invaluable guide to the architect, plumber, heating engineer and house owner, telling just what is necessary to make a home completely sanitary from the subsoil to the roof. 8x5¼ in.; 272 pp.; bound in cloth. Postpaid, $2.00.

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